Telephony.

THE AMERICAN TELEPHONE JOURNAL

Comprising Telephony, American Telephone Journal, Sound Waves, Telephone Magazine and The Telephone

Vol. LIX CHICAGO, SATURDAY, OCTOBER 15, 1910 No. 16

PUBLISHED EVERY SATURDAY BY THE

Telephony Publishing Company

Monadnock Block, Chicago

H. B. McMeal, President F. S. Kenfield, 1st Vice-President
W. H. Graffis, 2d Vice-President H. D. Fargo, Secretary-Treasurer

Edited by H. B. McMeal and Franklin H. Reed

Contributing Editors

Max W. Zabel, Patent Dept. J. C. Kelsey, Financial Dept.
A. H. McMillan, Legal Dept. A. B. Smith, Technical Dept.

The present publication comprises: The Telephone, Telephone Magazine, Sound Waves, American Telephone Journal and

Vol. 59 Telephony. No. 16.

TERMS OF SUBSCRIPTION:

United States, Cuba and Mexico.....per year, $3.00
Canada 4.00
Other Foreign Countries within the Postal Union..... 5.00

NOTICE TO ADVERTISERS

Changes of advertising copy should reach the office ten days in advance of date of issue. New advertisements accepted up to noon Thursday for the paper dated Saturday of the same week.

Entered as second-class matter September 4, 1908, at the post office at Chicago, Ill., under act of March 3, 1879.

CHICAGO, ILL., SATURDAY, OCTOBER 15, 1910.

CONTENTS.

Editorial 437
Chasing Trouble. By J. C. Fuller..... 439
The Ranking Decision on Electrolysis..... 441
Loaded Aerial Lines in Germany. By Dr. A. Ebeling..... 444
The Child's History of the (Bell) Telephone. By J. C. Kelsey 447
Frank H. Woods Favors Physical Connection..... 449
Work of the Patent Office. By Max W. Zabel..... 450
Before Courts and Commissions. By A. H. McMillan..... 451
Ideas of the Workers..... 452
Events in the Field.....454, 455, 456, 457, 458
News from Across the Seas. By Abercrombie..... 459
Telephone Finances 460
The Purcell Rate Case..... 461
More Man-Power Through Competition. By Walter Dill Scott 464
The Electromagnet Receiver. By W. J. St. Onge..... 466
Products of the Factory..... 468
Condensed News Reports.....470, 471, 472

"Monopoly is a great enemy to good management, which can never be universally established but in consequence of that free and universal competition which forces everybody to have recourse to it for the sake of self defense."—Adam Smith, in "The Wealth of Nations."

Woods on Physical Connection.

F. H. Woods has lived up to his record of doing things vigorously by declaring for "physical connection" under proper laws enforced through the supervision of a governmental regulative body. Mr. Woods stated to a representative of TELEPHONY that he wished in the report of this interview to have it emphasized that this is the statement of his personal attitude, and is not intended to indicate the policy of the National Association.

The statement of his attitude speaks for itself, and we commend it, and the subject, to our subscribers for most careful reading and consideration. In giving it such consideration it is well to bear in mind that conditions have changed somewhat since physical connection was first proposed, and met with bitter opposition on all sides.

Partial supervisory power over the telephone business has now been vested in the Interstate Commerce Commission, in so far as interstate business is concerned. State commissions have certain authority over the telephone industry in several states, and the number of states in which such supervision will exist is practically sure to be greater each year by one or more additions, as the legislatures meet.

The trend of development in public utility business is to afford the public the greatest possible service value commensurate with a fair return on investment. If both of these objects can be promoted by physical connection under proper laws and supervision, it will be a good thing. If it simply creates a disturbance in the industry without accomplishing such beneficial results it will be a bad thing. The critical point is the kind of laws which will be passed, and the interpretations which will be placed upon them by supervising bodies. Mr. Woods feels strongly that the public will support a square deal in the telephone business, and compel what is right.

Undoubtedly more stable relations for interchanged business could be secured under competent compulsory physical connection laws, and proper supervision, than can be hoped for under voluntary contract arrangements—such as have proven an

ultimate detriment to local companies in many sections. Such companies, instead of a contract dictated by a competitor claiming natural right to monopoly would have a security for the permanence of their connections which they can never possess if they make such connections voluntarily under pressure of their competitor. Local ownership would certainly give the small companies an advantage in securing fair laws and development under them.

There is one thing certain. Before physical connection can be equitably enforced there must be laws which will heavily penalize the offering of rebates as between persons and as between places, so as to prevent cut-rate, cut-throat competition, and guerilla warfare such as has been such a detriment to the business in the past.

It is well known that Mr. Theodore Gary has for upwards of three years strenuously and consistently urged the passage of laws providing for physical connection under equitable terms. He has been opposed by some of the ablest thinkers in the Independent industry. Conditions now are believed by a number of these same men to have changed, through the greatly increased development of the locally owned companies, and many of the former bitter opponents of the idea are not now so hostile to it.

This question is not one which demands immediate action except in the way of consideration. It requires careful thought. If it is agreed that the plan is good, if carried out under certain conditions, those precise conditions must be determined. Then an educational campaign would have to be carried on, and it would be a considerable time before results could be achieved. But whether the consensus of opinion be that it is, or is not, a good plan, the question has been raised in such definite form that it demands consideration *now*.

TELEPHONY urges its readers to write to the Editor without delay, giving information as to their personal situations and their views as to the effect upon their business of such a proposition. All such communications not accompanied by permission to publish will be held confidential.

The Legal Status of Electrolysis.

An important decision on the question of electrolysis was rendered October 5, 1910, by Judge A. L. Sanborn, of the United States Circuit Court in the case of Peoria Water Works Company vs. Central Railway Company, et al. An outline of this decision is contained elsewhere in this edition.

The gist of this ruling is that electric railway companies cannot use the earth as a return circuit with utter disregard to the damage resulting therefrom to water mains. It is the duty of electric railway companies to carry the return current back to the generating stations in such a manner that it will not damage the property of others by electrolysis. It is the duty, however, of water works companies to co-operate with the electric railway companies to bring about this end.

The principle herein involved will apply generally throughout the United States to underground cables, gas mains, etc., as well as water mains. If telephone cables are being injured by electrolysis caused by currents discharged into the earth by electric railway companies, and the railway companies refuse or neglect to make good the damage done and remove the cause of injury, telephone companies may enjoin them from continuing the injury, since the decision holds that the power companies must care for their return current.

From this it can readily be inferred that the courts will hold that such power companies must also use their currents in such manner as not to do unnecessary damage by induction, to other wire using companies.

This case has been well fought on both sides, having been in the courts for about twelve years. We believe that Judge Sanborn has announced a correct and fair principle and telephone interests are to be congratulated that there has been an authoritative announcement on a modern question which so vitally concerns them.

The most practical way to surmount our difficulties is to face them defiantly. The man who shirks his painful obligations is the worst of cowards.

Indiana Decision Upholding Exclusive Contract.

The precise point for which the Independent telephone companies contended in the Middlepoint, Ohio, case, has now been upheld by a decision filed October 4 in the Appellate court of Indiana.

To state the matter in the words of the Court: "The vital question in this case, presented in various ways, is whether the provisions of the contract whereby it is stipulated that appellant shall give appellee all toll business originating in Wabash and points outside, coming through appellant's exchange and directed to points on appellee's lines, constitute a valid obligation. * * * If this provision of the contract is invalid, it must be because it tends to create a monopoly, is in restrain of trade and against public policy. * * * It is found by the court that the contract was entered into for the purpose of establishing a competitive long distance telephone system in the localities named; (competing with the Central Union) that such a mutual agreement was essential to the existence of such a system. The main purpose of the combination was, therefore, not to restrain trade, but to extend it."

This seems to deal most admirably with the question raised by those advocates of the Bell interests who have assumed to jeer at the attitude of the Independents who desire their own exclusive contracts upheld, while contending against some of the privileges claimed by the Bell company under contracts broadly similar.

The purpose of Bell exclusive contracts is monopoly. The purpose of an Independent exclusive contract is to strengthen the position of the contracting parties so that they may more effectively and permanently compete with the Bell system, already widely established and holding an interconnecting network of lines.

The Indiana court is to be congratulated on having seen this point clearly and rendered an unflinching decision based upon broad grounds of public policy.

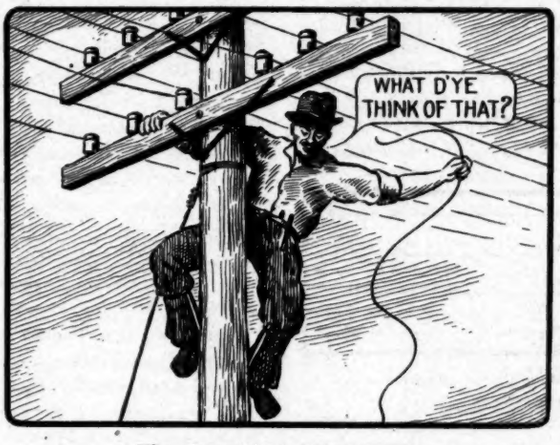
Chasing Trouble

With a Few Good Natured Knocks on the Wire Chief.

By J. C. Fuller

It is true, as was once stated in an editorial in TELEPHONY, that knowing what to look for equals the trouble half cleared. It is also true that not half of the troublemen in large exchanges do know what they are looking for.

An all wise oracle at the wire chief's desk informs you that 123 is "short" and after giving you other information, such as where 123 can be found, etc., he rather impatiently waits for you to call for O. K.



The Astonished Troubleman.

Such information as "pretty close to terminal," "look for swinging coppers close by," "looks like short circuited condenser or generator shunt stuck," you will not get out of one wire chief in ten, and not half of them will trouble their heads about finding out what it really is and where it is.

Wheatstone bridges, voltmeters, ammeters and all such are kept for ornament only, and it is quite unnecessary to soil their highly polished keys. Such things as requests to locate the short "tell me whether it is on this side or the other side of me," without opening the line are looked upon by them as insults to their intelligence, and some of them will argue that the feat is an impossible one. That usually means for the "chaser" to hike to the terminal or cut the line, in either case an uncalled for waste of time, involving waste of material as well, to say nothing of unnecessary joints in the line.

On short lines this does not make much difference, but on long lines it makes a whole lot.

Upon getting "clear and open to you" or "still short," you close the line and go in whatever direction your trouble might be. Possibly the next stop is at the subscriber's place, to replace a receiver left off the hook, as some wire chiefs are so sure that they got a "too high reading" that they will not put on a howler.

The Indignant Wire Chief.

All this waste of labor can be saved by a good wire chief. He should have records of resistance of all his lines with receiver off the hook, as well as records of voltmeter readings caused by different troubles. The resistance of the cable system in his exchange should also be a part of his records, together with temperature coefficient corrections for all seasons. His desk should be equipped with high resistance voltmeters (100,000 ohms) with 40 and 2 volt scales; also a rheostat so arranged that any resistance could be used from 1 to 2,000 ohms in series, or as a shunt.

If there is no earth potential, this equipment will be sufficient for any size of an exchange, but if there is an earth potential a Wheatstone bridge also should be added.

With this equipment installed, and a good man to use it, there is no reason on earth why wires should be opened at all at any time or any place, regardless of the nature of the trouble, except in case of a party line branching out in different directions, which may be opened to see which loop the trouble is on. Nor is there any reason why a troubleman cannot be directed to the seat of the trouble, where it becomes only a question of the troubleman's sight if the trouble is not promptly cleared.

That some wire chiefs are very indifferent goes without saying, and the following illustrates it.

A trunk line 32 miles long showed an escape of about 25,000 ohms on one side; the line worked fairly well until phantomed, when transmission became an impossibility. The wire chief located the trouble "somewhere about there," giving limits covering 126 poles about half way on the line. Troublemen could not find anything on the entire line, although three of them walked the entire distance, one of them making a round trip. The total time spent was eight days, but the wire chief did not make any effort to get a close location, nor did he in any way assist the troublemen in finding it; the circuit was of No. 8 copper, and orders are very strict against opening them.

Upon going over to the exchange I noticed that on account of high resistance of the fault, 10 cells of the wire chief's battery was not enough to get a definite location, and he was too lazy to connect up some more cells, so that in the Varley loop test, 15 ohms employed one way or the other did not make any difference in the deflection.

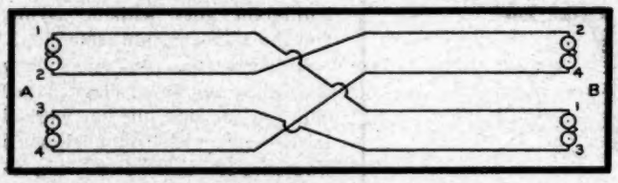
I used 80 volts and got a very good location. The poles being numbered, I gave the troubleman numbers of eight poles, among which I was positive the trouble ought to be found. After telling the wire chief to give the troubleman all assistance possible I felt sure that it would be cleared, and went home.

You can imagine my surprise, when next morning, I was informed that the trouble was not there. I called up the troubleman for an explanation, and he said that the trouble was not there, because it could not be seen there. He said that the wire chief declined to give him any assistance beyond telling him that it was "somewhere about there."

Back I go. I used 120 volts, corrected for temperature coefficient very carefully, and located the trouble right in the same place as before. I had lost my faith in trouble-

men sent alone, so I went with one of them. Another surprise! There was not a thing anywhere near the wires, not even broken glass, and I doubt whether there was a leaf of a tree touching a wire on the whole length of the line. Only one anchor guy was in sight, about seven feet away from the wires in question.

My confidence in Wheatstone bridges dropped to about zero. In all events, I decided to climb at least ten poles before asking the wire chief's assistance. I told the man to begin with the pole with an anchor guy, and behold, my man comes down with about 10 feet of No. 30 B. & S. copper wire which had been neatly wrapped around the wire, carried along the cross-arm to the pole, then up to an anchor guy which was fastened to a granite ledge by an expansion eye bolt. It was the spite work of a discharged employe! Certainly the troubleman was not to blame for not finding it when it could not be located without a very powerful field glass, and with such random location men could not be expected to climb 126 poles. But with the wire chief the case was different, because with the trouble-



Case of Split Pairs, Which Stupid Wire Chief Diagnosed as "2 Pair Crossed."

man out on the line the trouble could have been located within a very few hundred feet.

Another instance of downright stupidity of the wire chief, and unnecessary work for the troubleman is illustated in the following:

Two pairs of trunks were phantomed, and it was necessary to cut in a few phantom transpositions. In cutting these transpositions one mistake was made so that the pair became split as in the illustration.

The wire chief at "A" gave an O. K. on transpositions, but later he discovered that the wires would not work, neither singly nor as a phantom, and promptly diagnosed the trouble as two pairs crossed, and sent out a troubleman, who, going to the terminal, made a magneto box test. Being convinced that they were not crossed he told the wire chief so. That dignitary felt himself to be very much insulted, gave the man a good tongue lashing, and informed him that if he did not like it he knew what he could do. The troubleman looked for a cross for 17 miles, and of course did not find it. More calling down for him, and more tongue lashing. The troubleman started back, and going up on the terminal pole at "B" got his O. K.'s from both wire chiefs at "A" and "B." But when he closed the wire the same trouble was found to exist. More hard words between the wire chiefs, the troubleman getting a lion's share!

The troubleman re-covered the line going back, with no results, and on his getting in was promptly suspended. The next day another man was sent, with the same results. With both troublemen yelling murder, with the wire chief a close second, I went over to "A." I told the wire chief to test the wires, and I could not help seeing that they could not be crossed. With four cells of dry battery and a head receiver I went to the main frame, and had no difficulty in picking up "B" on split pairs. I told the wire chief at "B" to open up both pairs and leave them open. Then I put four cells of battery on one pair, and, after carefully explaining to the troubleman what the real trouble was and where he would be likely to find it, I sent him out. I also explained the method of making tests for himself. In two hours the trouble was cleared and he was back.

Now this trouble is not hard to test for. In fact it is one of the easiest. It calls for opening the lines at the distant exchange, and then for the troubleman to go across the line and call in until he can not do so any more, which will show that he has passed the trouble.

These instances go to show that good wire chiefs can reason out the nature of troubles, and, by posting troublemen as to what they may expect, can accomplish more in a given time than one who blindly depends on his instrument readings.

An almost endless variety of tests can be made from a standard desk of a wire chief but, sad to say, very few wire chiefs have ingenuity enough to test for any unusual cause, as the following shows:

A trunk line, nine miles long, became slightly noisy; insulation over one megohm.

The line was covered, cut up, tested and retested, but the cause of noise still remained a mystery. I opened it at the distant exchange and tried the capacity test. The difference in capacity between sides of the line showed very plainly. I located it in a cable where conductors must have been crossed together with some spares or unused wires.

Although the trouble was in for five days, the wire chiefs did not exert themselves to ascertain the nature of the trouble, but practically left it to the troubleman, and actually gave him O. K. by it. This meant some wasted time, livery hire, and perhaps some blame attached to the troubleman by wire chiefs.

Some men are naturally born troublemen, but most of them are made, and, as a general rule, they are as good as their makers, and never better. Show me a wire chief, who, after having his men for a year or more, still complains of their inefficiency, and I will show you where that inefficiency really lies.

I have seen cases time and time again in many different exchanges where a wire chief and his force became totally demoralized after a severe thunder, wind or some other storm All trouble records were in delightful disorder, and no routing out of any kind made. A troubleman was sent to a distant trouble, past five or six others of the same nature, and brought back over the same route and sent to another part of the exchange, where perhaps he met his co-workers going to the place he just came from, and so on through the day. Troublemen go weary and footsore, with perhaps very small showing to their credit and no praise, and the wire chief likewise, possibly thinking that he has about the very worst lot of troublemen that can be got together.

A little study on his part would show where the fault really lay, and until he learns the meaning of that magic word "system," he never will be able to get a very efficient and painstaking troubleman.

Good wire chiefs can handle indifferent troublemen with fair results. But have the wire chief at the desk indifferent, it is a drawback to a good troubleman.

A good system of trouble chasing is to clear the trouble so that it never will show up again; but when the wire chief tells a man that it will be attended to at some other time, and that time usually comes on stormy days, he makes the system just the reverse of what it ought to be.

Self-gratification! with a combination of interests having this as its emblem what hope has the individual of mercy? Why proclaim the beauties of philanthrophy and then steal individual rights like a thief in the night?

The Ranking Decision on Electrolysis

Right to Protection of Underground Property from Excessive Stray Currents, Productive of Electrolysis, Seems Established After Twelve Years of Litigation—History of the Famous Peoria Waterworks Case—Master's Findings of Fact and of Law—Opinion of Judge Sanborn of the U. S. Circuit Court

A street railway company having a defective return system, permitting leakage of current which causes electrolytic damage to property of other public utilities occupying the streets under equal rights, may be enjoined from continuing to operate the system in its defective condition after the lapse of a reasonable time for repairs. Such, in its broadest interpretation, appears to be the significance of an opinion by Judge A. L. Sanborn, of the U. S. District Court, filed last week in the famous Peoria Water Works case.

Brief History of the Litigation.

The title of this case is Peoria Waterworks Co. vs. Central Railway Co., et al.

March 21, 1898, the waterworks company filed a bill in the Circuit Court of the United States, Honorable Peter S. Grosscup, Judge, praying for an injunction restraining the railway company from using the earth as a return for its trolley circuit. May 25, 1898, the cause was referred to Special Master in Chancery Frank L. Wean of Chicago. A great deal of time and money was spent by both the complainant and defendant in securing expert testimony, which was heard by Special Master Wean.

Judge Grosscup sat on this case for six years and refused to re-refer it or take any action. During October, 1907, however, he re-referred it to Judge Landis, who in turn referred it to Judge A. L. Sanborn of the United States District Court, Madison, Wis. He, on October 25, 1907, re-referred it to Special Master Frank L. Wean to take further evidence on certain specified points. Special Master Wean filed his second report during June, 1909.

Judge Sanborn heard final arguments in the case during May, 1910, and on October 5, 1910, filed his opinion.

Following is an extended abstract of the Master's report:

Master's Report—Statement of the Cause of Action.

The amended franchise under which the complainant operates, contains sections permitting the company (a) to use the streets within the present and future limits of the city, "subject to the restrictions, limitations, and in the manner herein provided, for the purpose of laying, taking up, repairing or otherwise maintaining and operating main pipes, hydrants and other appurtenances."

(b) Reserving to the city the right to disturb the pipes for making city improvements, "but nothing herein shall be so construed as to release contractors with city from liability for damage caused by disturbing said pipes."

(c) "The City of Peoria will adopt ordinances protecting the grantees in the safe and unmolested excercise of the franchise and license hereby granted."

The original franchise grant under which the defendants, The Central Railway Company and the Peoria & Prospect Heights Railway Company, were operating provides that electric motive power and none other shall be used, that the railway company shall be liable for all damages "which result from the passage of this ordinance or from carelessness, negligence or misconduct of said company, * * *"

No ordinance prescribes a particular system of operating by electricity to be used.

Of the complainant's mains an important part were laid before any license had been granted to the Street railway company by the City.

The report cites the manner of conveying electricity from the power station to the cars and return according to the familiar single trolley system.

Evidence was presented to show the responsibility of the railway company for the electrolytic damage to complainant's pipes.

An extended electrolytic survey had been made in 1894 revealing the cause and extent of damage.

In June 1899, after considerable improvement had been made by the railway companies in the way of heavier rails and better bonding, and an improved return system, a second electrical survey showed a large volume of current still flowing between the rails of the defendant and the pipes of the complainant.

No Complete Remedy for Electrolysis with Single Trolley System.

The Master's report says:

"The evidence discloses no known method by which the complainant, by its own action, can protect its water distribution system of pipes and mains from the electric currents of the defendants' single trolley railways.

"The evidence discloses no complete remedy for the injury to these water pipes except the entire removal of electric current from the water mains; such removal is impossible so long as the return currents of the electric railways are grounded or in electrical contact with the earth. The other methods which have been suggested by the defendants in this case do not, in practice, and cannot prevent the escape of a portion of the current into the ground and water pipes."

Effective Method of Preventing Electrolysis.

"The defendants can prevent the injury by controlling the current by the use of a complete metallic circuit insulated from the rails and ground providing a channel for the return of the current to the generator as perfect as the channel that is provided to supply the power along the street for use."

"While the evidence in the record as to the exact cost of changing the defendants' system from the single to the double trolley is conflicting and unsatisfactory, it is sufficient to determine the fact that such cost would not be so unreasonable and excessive as to make it impossible for the defendants to adopt the double trolley system."

The defendants' negative return system is as good or better than the average, and no improvements known in the art can better the electrolytic conditions while the single trolley system is retained.

The master summarizes the ulimate facts disclosed by the evidence as follows:—

"1. The injury complained of exists.

"2. The injury is permanent and continuing.

"3. The injury has been and is being caused by the defendants.

"4. The complaint can do nothing to prevent the injury.

"5. The defendants can prevent it by the use of the overhead double trolley system or by any system which provides a completely insulated metallic circuit for the electric current.

"6. The overhead double trolley system, though more expensive to install, has been demonstrated by use and experience to be as safe, economical and satisfactory in its operation as the single trolley system."

Conclusions of Law.

Following the findings of fact Special Master Wean reports conclusions of law, establishing the jurisdiction of the court; that the streets may be legitimately used as receptacles for water pipes; that such use is in no way subservient to the use for electric street railway service; that both defendants and complainant are entitled to the equal protection of the law against invasion of their rights and property.

An important section recites:

"The injury which is being done to complainant's water pipes by the defendant's currents of electricity is not a mere incidental injury or inconvenience, but is a permanent, continuing injury to a legal right, which will, in effect, if the injury is permitted to go on, ultimately result in the absolute destruction of complainant's plant and property. This would amount to nothing less than the taking away from complainant of the use of its property by the defendant street railway companies, which, if it be done under their license from the city, authorizing them to "propel their cars by electric motive power," would be a taking of private property for public use. The constitution of Illinois provides that "private property shall not be taken or damaged for public use without just compensation."

The report continues:

"The injury complained of in this case is the direct and immediate result of defendants' acts—as much so as if the defendants were to deliberately uncover and destroy by any other means the water pipes of complainant. The defendants, by taking the necessary, reasonable precautions in operating their railways, would be able to avoid the injury, and this being true, their failure to take such precautions must be considered as negligence.

"The injury found to be going on in this case is the direct consequence of the unnecessary and wrongful acts of the defendants in accomplishing a legal result, that is, the propulsion of cars, and unless the defendants are protected by their license from the city they are liable to the complainant for such injury. These acts, unnecessary and wrongful in themselves, are not rendered lawful by the ordinance granting the use of the streets for the purpose of propelling cars by electric motive power, and inasmuch as they work "hurt, inconvenience and damage" to the complainant, they constitute a nuisance which is actionable at the suit of the injured party.

"The injury complained of being actionable, there can be no doubt of the power of the court to grant some remedy. A suit and recovery at law would not stop the injury, which is, and must necessarily be continuous under existing conditions. The only adequate remedy is, therefore, by injunction, as prayed in the petition.

"The special master's conclusion is that the bill and evidence make a case of equitable jurisdiction and that an injunction should issue as prayed, subject to such reasonable conditions as to the court may seem right."

A supplementary report of the Master deals with questions of the court dated September 10, 1907, bearing upon the point whether the art had so progressed since the original investigation as to enable the defendant to substantially prevent the injury to the distributing system; the actual means then employed to prevent injury to the complainant's system; and the extent of damage to complainant's system since the closing of proofs in the prior hearings.

In response to these interrogations Special Master Wean made a supplementary report on June 1, 1909, after taking testimony. It was found that improved bonds had been installed, negative overhead return wires run to the power house, and other improvements made in the conductivity of the return system, but as the average load of the railway system had been largely increased the escape of current and the injury to the complainant's system had continued.

No competent, direct evidence was offered bearing upon the relative merits of the single and double trolley systems with respect to resulting injury to underground structures of other corporations.

The preponderance of evidence established the fact that the improvements in the return system under the single trolley system would not prevent the escape of an injurious amount of current to the complainant's pipes.

The supplementary report recites that the evidence on this reference tends to confirm the findings and conclusions stated in the previous report.

Abstract of Judge Sanborn's Opinion.

The opinion recites finding of facts and legal conclusions of Special Master Wean, as covered in abstract above.

Following this quotation the opinion recounts definitions of terms used by expert witnesses to facilitate subsequent discussions. The contentions of the plaintiff and defendants are summarized.

On the merits the defendant contends, among other points that the remedy suggested calls for the exercise of the police power for protection of the public safety, to be applied only by the legislature or city council, and not by the court. In other words, the court can exercise only judicial, not legislative, functions.

The injury in Peoria is not one general to the whole piping system, but is localized to the region near the power station; and the damage is growing continuously less and less by better methods of negative return all over the country, and particularly in Peoria. There is no great or irreparable injury, it is said, sufficient to justify the restraining of the public service of carrying passengers in defendant's cars, except on conditions of installing the double trolley, or other insulated system. Further, that the installation of the double trolley is unreasonably expensive, and its use is dangerous, nor will it entirely prevent the escape of electric current into the ground, and upon the water pipes so as to cause injury."

Citations made establish the position of the court as unable to prescribe by injunction the use of any particular system or circuit or negative return.

"It is doubtful, indeed," says the opinion, "whether the judicial power would extend to the making of a decree restraining the defendant from continuing to serve the public unless it shall cease injuring complainant's water system. The utmost relief is to restrain defendant from continuing the injury, assuming for the present that sufficient damage is shown, and punishing it and its officers for contempt in case of disobedience, leaving the means of curing the injury entirely to its discretion. In case of such a result, a decree might be rendered in contempt proceedings brought in this suit on the equitable side, awarding compensation for such injury as might be shown, with incidental punishment. Or a proceeding for a criminal contempt might be brought, in case of deliberate disobedience, in which a fine or imprisonment might be imposed."

Court Unable to Prescribe Specific Remedy.

The inability of the court to prescribe a specific system to remedy the fault is based on the theory that the court is not clothed with legislative power. The duty of the defendant is to make the damage as little as possible by using the best methods reasonably within its power; the selection of such means to be left to its discretion, and at its peril of failure to exercise such discretion in a fair, bona fide way.

Conclusions from Evidence.

After summarizing evidence, the opinion says: Complainants' water works system is being damaged by electrolysis caused by electricity generated by defendant, but not so seriously as reported by the master. This injury should be stopped. Complainant cannot, in the present state of development, find any reasonably practical way to cure it. Both parties insist that the injury is curable, but they differ as to means. The subject has been most seriously studied by many engineers, and there is a difference of opinion among them whether anything short of a metallic circuit will be a complete remedy. Many other plans have been tried. The effort has been made to so protect the rail return as to prevent escape of current into the earth. No claim is made that this can be fully done, but some eleven witnesses testified on the second reference that the rails can be so bonded and cross bonded as to practically stop electrolysis of the water pipes, with the assistance of other means of negative return. Nearly as many other witnesses are of opinion that no such thing is possible, and the master agrees with them, and has recommended the compulsory installation of a metallic, non-rail return circuit.

Modern Rail Return Construction.

"Four plans of improving the rail return are explained by defendants' witness, which they think practically efficient. They have been used more or less since 1899. All of them contemplate the use of the brazed rail bond, of which defendant had installed about six miles at the time the testimony was closed on the second reference. This bond consists of a number of leaves of thin copper folded back and forth on themselves, with a piece of brass wound around the end, and applied to the side of the ball of the rail near the end. The rail is first ground with an emery wheel to make it clean and bright. Then the end of the bond is clasped between a carbon plug and the rail, and subjected to a current of 2,000 amperes passed through bond and joint until the brass melts and flows upon the clean rail surface, thus making a perfect and permanent electrical contract. Each bond is equivalent in conductivity to three feet of rail, that is, to one fourth as great a conductivity as that of a continuous rail, and each has a conduvity than the trolley wire.

"The first plan consists in the use of some efficient form of rail return, as the brazed bond, welded joint, etc., with cross wires between rails and assisting the return by feeder wires from rail to negative side of dynamo, at regular distances from the power house. This is the system now in use in Peoria. The second plan is called the quadrilateral or constant potential system and is simply a modification of the first, with additional bonding at crossings and switches. This system is recommended for Peoria by defendant's witnesses, with a possible addition suggested by Mr. Winters. It was called quadrilateral because of its supposed application to the case of a railway surrounding the center of a city, and forming a four-sided network of rails, requiring a four-sided system of negative return copper wires from the track, and bringing them together to the negative side of the dynamo. The purpose is to reduce to a constant potential all the negative feeder points, and by expanding the feeders in the shape of a fan, to equalize the pressure all over the rail system, thus preventing, as much as possible, the escape of current from the rails, and its return to the power house. The system was installed in Richmond, Virginia, by Mr. Waterman, and he claims to have reduced the amperage on the water pipes from a varying current of considerable size to a maximum of less than one ampere. It is also being put in at Toronto. The underlying idea is that the tendency to leakage of current from the rails varies as the square of the distance between feeders, so that the putting in of an additional feeder divides the distance by two and the leakage by four. In Richmond, four copper wires, three quarters of an inch in diameter were attached at one end to the negative bus bar at the station, and at the other to an extended network of smaller wires attached to the rails. Each system of wires extended in a different direction.

Bonding Used to Protect Telephone Cables.

"The third plan is called the drainage system, often used to protect the sheaths of telephone cables. In this the rails and pipes are regarded as a parallel conductor system of return feeders, pipes and rails being connected by copper wire. This can only be put in when the owners of both systems are working in harmony. It is in use in Rochester, New York, where it is claimed to have avoided trouble from complaint of electrolysis. The testimony as to its efficiency is conflicting.

"The last plan is not fully described in the proofs. By this it is sought to constantly keep the whole piping system negative to the rails, so that no current can flow from pipe to rail. This may be done by copper wires, or by a negative booster, an additional dynamo so connected with the pipes as to produce upon them a lower potential than upon the rails.

Legal Remedy by Injunction.

"Defendant should be enjoined from continuing the injury to the complainants' water mains and service pipes, and should be given a reasonable time to take such measures, or put in such improvements to its negative return, as will substantially prevent injury. This should be upon condition that complainant co-operate with defendant so far as reasonable and proper, in aiding it to prevent or lessen the escape of current from its rails, or in preventing the escape of current from the water pipes in such manner as to cause injury thereto. The matter of the terms of the decree in these respects, as well as the modification of the findings, will be further considered on application for decree."

Rain Shows Up Weakness in Cable Sheaths.

Three days and three nights of cold, continuous rainstorm wrought havoc with telephone lines leading into Louisville and especially with those connections in the city itself. During one day of the deluge the Louisville Home Telephone Company received no less than 500 trouble calls. A majority of these calls were necessitated by water which soaked through small apertures in the cable and caused trouble with the circuit. These apertures were scarcely discernible to the eye, and would not be affected by rain water except in case of a heavy downpour.

"The Biblical flood could scarcely have had worse effect upon our telephone service than did the deluge of last week," said Engineer Vincent E. Furnas, who worked continuously for two days and two nights without rest in marshalling his repair forces. "In case of a damaged cable, there is but one thing to do, locate the hole and slip a sleeve over the cable jacket to protect it. The cause of so many cables cracking in Louisville during the recent rain was that cold weather accompanied the downpour. The cold contracted the cables and widened apertures that would have otherwise been untouched. The co-efficient of linear expansion in a telephone cable is very great, and they are easily affected by sudden changes from heat to cold, or vic versa."

The greater value you place on your time the more will others appreciate it. Spend each moment wisely and strive with the determination to make your labors ennobling.

Loaded Aerial Lines in Germany*

The Pupin System Applied to Aerial Telephone Lines

By Dr. A. Ebeling

The first question to be considered was whether on the insertion of induction coils in aerial lines the apparatus would be capable of resisting electrical discharges. As a good permanent state of insulation plays a large part in aerial lines, it was decided not to employ arresters with earthed connections, and preference was given to any ap-

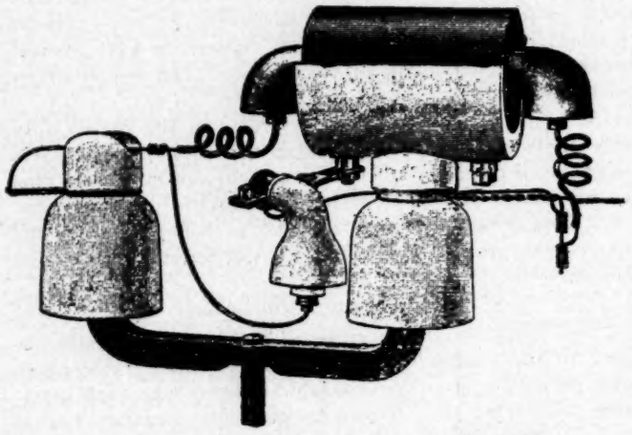


Fig. 1. The Short Circuiting Type of Arrester.

paratus short-circuiting the coil. This apparatus was mounted in a primitive fashion on the Berlin-Magdeburg line (see Fig. 1) and worked very well. Only the arresters were damaged by lightning and not the coils, although the discharges were sufficiently strong to fuse the line wire. Consequently lightning arresters have been regularly employed on pupinised lines and the apparatus has always been an arrester mounted in parallel with the coil. The external form has changed in course of time but the principle has always remained the same. Fig. 2 shows the vacuum arrester as it is used today. It will be seen that it is completed by a rudimentary arrester formed by the metal cylinders prolonging the two metallic caps and leaving only a small space between them. The edges of this space are pointed so as to form the points of the arrester. This rudimentary form of protector has been chosen because the coil is protected as far as possible, even when the glass covering is broken by a violent shock of lightning. In this case the spring of the vacuum arrester approaches the metal cylinders and short circuits the coil in such a way that any new strokes of lightning are unable to damage it. Fig. 3 shows the vacuum arrester alone and distinguishes the internal parts.

Lines with Single Coils.

The first aerial lines were provided with single coils on the A and B circuits. This was because it was desired to set up as simple conditions as possible and avoid difficulties of insulation and derangements which might have occurred if the A and B wire had been introduced into the same apparatus.

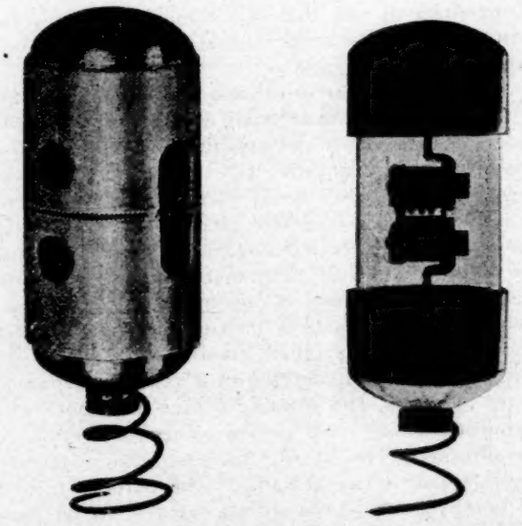
Coils Enclosed in a Cylindrical Elongated Covering.—Berlin-Frankfort-on-Main (first equipment). It was decided to equip a line as long as possible so as to give the Pupin system a fair trial, the first line experimented on (Berlin-Magdeburg) being only 150 km. in length. A new bronze wire 2.5 mm. in diameter was run on the Berlin-Frankfort route—a distance of 580 km. (about 360 miles).

This trial promised to give results all the more interesting in that there existed between the two terminal points one line of 4 mm. bronze and another of 5 mm. which could be compared with the trial line. The 4 mm. line was of the same length of 580 km., so that the results obtained could be determined exactly, while the 5 mm. line which was run on a different route was 540 km. in length. All lines were double wire.

The coil cases, placed at every 5 km. along the lines, had in general the same form (Fig. 4)—that employed in the Berlin-Magdeburg line. The cylindrical coils had a core and an envelope of special magnetic material by which they were surrounded and in which the two outgoing sleeves were fixed. It was thought necessary to be particularly careful in the first aerial line of any great length that the material of the iron core should not produce at higher frequencies greater losses which would destroy good transmission of the voice. The permeability of this iron was, certainly, relatively slight, but great enough to produce sufficient self-induction.

The lightning arrester, which was fixed on a second insulator, was of novel form. The vacuum arrester was placed in an ebonite bell which could be easily unscrewed. Fig. 5 shows the apparatus with the arrester open. Fig. 6 shows the coil case on the arms of the pole.

The line was first of all run entirely without coils, so that



Figs. 2 and 3. Vacuum Arrester Used at Present; the Right Hand Illustration Shows Interior Parts.

the results given by the line without coils could be ascertained. But the points where the coils were to be placed were marked in advance and measures were taken that the fixing of the apparatus could easily and rapidly be made.

*On account of experiments made by Siemens & Halske in cooperation with the Imperial German Post Office, originally appearing in the Electrotechnische Zeitschrift, and translated for the National Telephone Journal.

Attempts at conversation on the three above-mentioned lines were then made, and it was found that the volume obtained on the 4 mm. and especially on the 5 mm. line were, as might be expected, considerably greater than that of the trial line before the fixing of the coils.

The coils were at length fixed on the trial line and at-

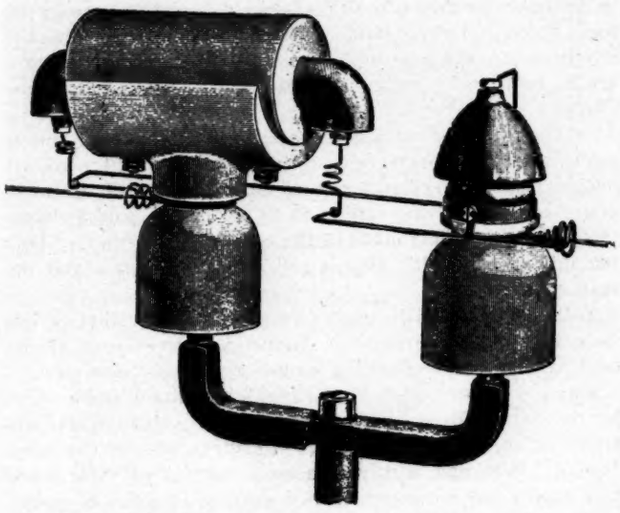


Fig. 4. Coil Cases as Mounted on the Berlin-Frankfort Line.

tempts at conversation were made. The line with the greatest volume was still the 5 mm. line of 540 km. length. Then came the Pupin line with volume slightly weaker, and lastly the bronze line of 4 mm. The relation between the values of the volume on the three lines varied slightly on different days, due to the variable quality of the insulation of the lines; but generally the relation remained the same.

The results obtained by the trial conversations correspond in their results with the values given by calculations. For a long telephone line the product of the attenuation constant and the length of the line would form a basis. Neglecting

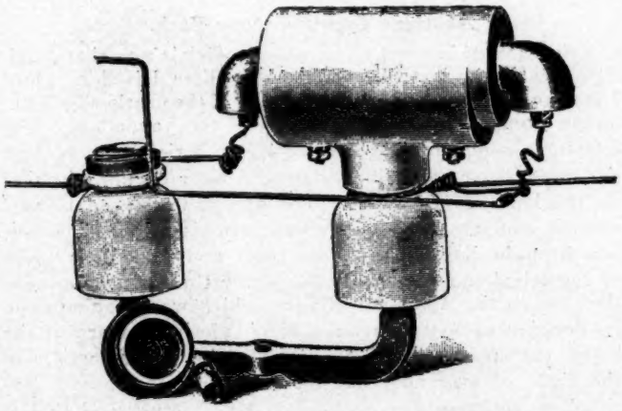


Fig. 5. Apparatus of Fig. 4, with Arrester Case Open.

the leakance—which is permissible since the insulation of the lines during the trial was at least 10 megohms—the value of the co-efficient of attenuation for the lines without coils is given by the equation

$$\beta = \sqrt{p\frac{C}{2}\left\{\sqrt{p^2 L^2 + R^2} - pL\right\}}$$

C being the mutual capacity, R and L the resistance and the inductance of the loop per km., and $p = 2\pi n$, n being the frequency.

For the loaded lines this equation takes the following simplified form:—

$$\beta = \frac{R_1}{2}\sqrt{\frac{C}{L}}$$

in which R_1 represents the resistance per kilometer value of line + coils.

The effective resistance of the different coils was about 8.7 ohms, and the self-induction about 0.11 henry. As the coils were placed at intervals of about 5 km., the fifth part of these values should be introduced into the calculation. The following table contains the numerical values employed for the electric constants of the lines obtained at 900 periods:—

(*a*) Effective resistance in ohms per kilometer of loop.
(*b*) Inductance in henries per kilometer of loop.
(*c*) Mutual capacity per kilometer in microfarads.
(*d*) Attenuation constant.

Lines.	a.	b.	c.	d.
Bronze line of 5 mm	1.92	186.10-3	0.0063	0.00176
" " 4 mm	3.00	194.10-3	0.0060	0.00262
" " 2.5 mm. without coil	7.70	214.10-3	0.0055	0.00591
" " 2.5 mm. with coil	11.18	4,610.10-3	0.0055	0.00193

All these values should be considered as theoretic data. Relatively to the value of $\beta = 0.00193$, the pupinised line corresponds to a line without coils of 4.7 mm. of diameter.

As the length of the 5 mm. line is about 540 km., and that of the other line is about 580 km., the following value is obtained for the product of the attenuation constant and of the length:—

1. For the line of 5 mm ..... $\beta l = 0.95$
2. " " 4 mm. ..... $\beta l = 1.52$
3. " " 2.5 mm. without coils ..... $\beta l = 3.43$
4. " " 2.5 mm. with coils ..... $\beta l = 1.12$

The smaller the value of βl the greater the strength of the line, that is to say, the greater the intensity of transmission. It is generally said that a lone permits good talking when

These values cannot be scientifically utilized for various reasons. First, the dynamometer employed was not adapted for such measurements because its resistance and self-in-ductance were relatively great; they were respectively about 400 ohms and 0.4 henry, but for this reason it resembled a telephonic station, that is why the values obtained appear to us instructive. Further, the intensities were much too strong, which is important in relation to the line equipped with coils, because the effective resistance at high frequencies was much more considerable than in the case of telephonic currents.

In all cases the curves show that the bronze line of 2.5 mm., which is much inferior to the 4 mm. line when it does not include the coils, become more powerful when equipped with coils and then takes rank between the bronze line of 4 mm. and that of 5mm.

All the curves fell considerably at high frequencies, but that was due to the dynamometer and not to the lines. This will be understood if one considers the impedance of the dynamometer

$$\sqrt{R^2 + (2\pi n L)^2} \text{ for } n = 900 \text{ and } 1{,}800$$

attains a value of about 2,300 and 4,500 ohms against a value of 400 ohms at 0.4 henry for the direct current resistance.

These results naturally did not give us full astisfaction. Therefore we were obliged to employ a final apparatus offering the

Fig. 6. Coil Cases Mounted on Cross-arms.

smallest losses possible. We used a bolometer to take measurements. It is true that this instrument is not very sensitive inasmuch as it is necessary to employ still greater intensities to obtain perceptible differences. The initial current had an intensity of 500 milliamperes, that is to say that it was five times stronger than with the dynamometer.

Fig. 8 shows the results obtained with the bolometer for the 5 mm. line, the 4 mm. line and the Pupin line; the meas-

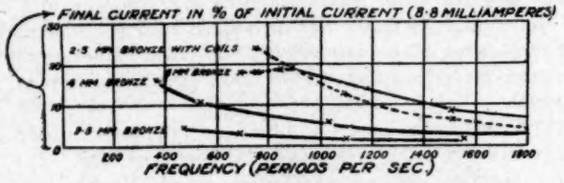

FINAL CURRENT IN % OF INITIAL CURRENT (8·8 MILLIAMPERES)
2·5 MM BRONZE WITH COILS
4 MM BRONZE
2·5 MM BRONZE
200 400 600 800 1000 1200 1400 1600 1800
FREQUENCY (PERIODS PER SEC.)

Fig. 7. Comparison of Line Losses by Different Size Wire with Currents of varying Periodicities; Results of Dynamometer Measurements.

urements on the 5 and 4 mm. lines being taken on two different dates. It wil be seen that the measurements vary very greatly, particularly those of the 5 mm. line. The values ascertained by the measurements differ also from the theoretic values, i. e., those obtained by calculation, which are represented by a thicker stroke; the difference, indeed, is very noticeable. After what has been said it is not astonishing that the Pupin line gave, with the high intensities which are employed ,inferior values to the 4 mm. line. In any

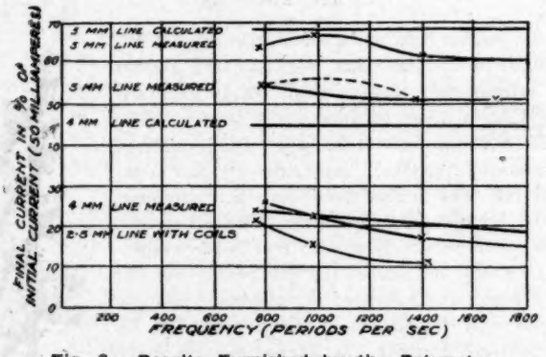

FINAL CURRENT IN % OF INITIAL CURRENT (50 MILLIAMPERES)
5 MM LINE CALCULATED
5 MM LINE MEASURED
5 MM LINE MEASURED
4 MM LINE CALCULATED
4 MM LINE MEASURED
2·5 MM LINE WITH COILS
200 400 600 800 1000 1200 1400 1600 1800
FREQUENCY (PERIODS PER SEC)

Fig. 8. Results Furnished by the Bolometer.

case the result of these bolometer measurements was that the heavy fall in the intensity noticed at high frequencies in the dynamometer measurements proceeded from the great resistance and high self-inductance of the dynamometer.

(To be continued.)

An Enviable Record Made at Warsaw, Indiana.

The Commercial Telephone Company, Warsaw, Indiana, is one of the thriving Independent telephone companies of that state, and has evidently been in public favor since its incorporation in 1900. The entire stock of this company, $50,000 in common stock, is owned by local parties, and seven years ago when the capital was increased from $30.000 to its present standing it was not found necessary to take in new parties, as the stockholders subscribed for the entire amount.

Dividends have been paid regularly, which accounts for the popularity of this investment. The first year 6 per cent was paid, and since that time the rate has been 8 per cent annually.

This company owns its exchange quarters, a two-story brick building, 46 x 132½ ft., worth approximately $16,000. From the rental to outside parties of offices and a storeroom in this building a net profit of $900 is reported for the company.

Depreciation is well taken care of by the company, *and the fund is always available in actual cash.* Each year 5 per cent on the capital investment is laid aside for this purpose.

The system, which is operated in Warsaw and in the surrounding rural territory, is in good condition throughout. A Stromberg-Carlson multiple switchboard has been in use four years, and the outside construction, mostly cable, was rebuilt within the past two years. No heavy open wire leads are to be found here, and 30,000 feet of aerial cable is employed.

Service is given to 1,210 subscribers in the city, and to 360 rural subscribers over its own rural lines. There are 410 business subscribers at a rate of $2.00 per month; 800 residence subscribers at a rate of $1.50 per month, and a charge of $1.00 per month is made to the country subscribers. About 160 miles of metallic circuit toll lines are owned and operated.

Toll business has increased 22 per cent over that of last year, and for the month of August an increase of 18 per cent over the corresponding month a year ago was made.

Simon J. Straus, banker, of Ligonier, Indiana, and a member of Straus Bros., the largest exclusive dealers in farm lands in the United States, is president of the company. John D. Widiman, attorney, a heavy holder of bank stock, real estate and securities, is vice president. John S. Baker, interested in real estate and loans, is secretary, and Silas W. Chipman, president of the State Bank, is treasurer. The latter three officers are of Warsaw. J. W. Scott is general manager. Mr. Scott is widely known as one of the most progressive telephone executives in the country, and his broad interest in the progress of the Independent industry has been attested by contributions to TELEPHONY, whose practical and helpful character have been recognized. Directors are Simon J. Straus, Isaac Straus, J. D. Widiman, F. M. Smith, Jas. S. Baker, J. W. Scott and Silas W. Chipman.

Stockholders in the Commercial Company are also heavily interested in the Noble County Telephone Company, of Albion, Ind.

Abutter's Rights in New York.

A decision of interest to telephone officials was that handed down at the last term of the Appellate Division, Third Department, New York, in the action of the Clarksville Telephone Company against Charles T. Terry, appellant. The telephone company sought to condemn a right of way over the Font Grove road, Slingerlands, Albany county, abutting on the land of Mr. Terry. The appellant refused to permit the company to build its line past his place. The case was brought into the supreme court and decided in favor of the telephone company. Mr. Terry three times brought the case to the Appellate division which was unanimous in its decision each time against him. The judges are of the belief that public necessity requires the condemnation of the right of way and that the telephone company is entitled to purchase any portion of Mr. Terry's land that it needs.

Fifty-Third Quarterly Two Per Cent Dividend of Citizens Company of Grand Rapids.

As regular as the movement of the seasons come the quarterly dividends of the Citizens Telephone Company of Grand Rapids—two per cent every three months. The directors have authorized the payment, on October 20, of the current dividend amounting at 2 per cent, to about $70,000.

The man who makes the loudest complaint about poor service is the quickest to disregard the rules for obtaining it.

The (Child's) History of the (Bell) Telephone

A Misnamed Book—Monte Cristo in the Flesh—Some Desperate Press Work—Inspectors by the Thousand

By J. C. Kelsey

My God! it talks!

No, gentle reader, this is not the third act of that thrilling melodrama "Belinda, the Beautiful Boilermaker."

These thrilling words fell from the lips of a king, an emperor, a ruler by divine right.

Dom Pedro attended the Philadelphia Centennial Exposition.

Carefully coached by a slick press agent, he introduced the telephone into the world.

When I pass the shores of Lake Erie, I think of Perry.

"We have met the enemy and they are ours."

As I see a picture of pyramids and sphinx, I think of Napoleon.

"Forty centuries of civilization look down upon you."

As I look upon the grave of Lawrence, I sadly think of:

"Don't give up the ship."

When I use a telephone out of Chicago, after a long duel with phantom circuits, operators, noisy lines and such, and finally hear a piping voice ten thousand miles away, it always flashes over me in surprise,

"My God! it talks!"

All of the foregoing apropos of a new history of the telephone written by Herbert N. Casson, the great Bell literary light.

As you read into this history you are reminded of the condition of the children of Israel.

That unfortunate people once did not own the earth.

They had to make bricks without straw for a few hundred years.

They were naturally in bad shape.

Moses providentially happened along and financed the expedition, at least, within sight of Canaan.

Note the striking similarity of the Bell conditions.

Mr. Vail providentially came along and financed the Bell Company within sight of its promised land.

Will he be compelled, like Moses, to eventually lie on "Nebo's lonely height" and see some Joshua slaying or buying up Independent telephone companies in an effort to build up one grand and universal system?

In the book there is some good advice.

At that time, the Bell people were afraid of the Western Union Telegraph Company.

Mr. Vail wrote to his weak-kneed agents:

"You have too great an idea of the Western. If it were all massed in one city, you might well fear it. For you to acknowledge that you can not compete with this influence when you make it your special business, is hardly the thing."

Mr. Independent Telephone Man—at one time the Bell were in your boots. Today, they own the Western Union. Tomorrow, if history repeats, you will own them, or at least have a memory of them.

Finally, the Bell company made such remarkable headway against the Western Union Telegraph Company, that they made this unprecedented deal.

The Western Union agreed

(1) To admit Bell as the original inventor.
(2) To admit his patents as valid.
(3) To retire from the telephone business.

In return the Bell agreed

(1) To buy the Western Union telephones.
(2) To pay it 20 per cent of all rentals.
(3) To keep out of the telegraph business.

This deal was called a master stroke on the part of the Bell.

It looks like it.

They gave up everything.

Glad to be alive.

Like the licensee stockholder today.

Going further, we learn that no one ever made any money.

Mr. Sanders sold for a million.

Mr. Hubbard got a million.

Wage-earner Watson got enough to start a shipyard and build war vessels.

Remember, at that time multi-millionaires were as scarce as hen's teeth.

As a proof that no one ever became a millionaire, or a multi-millionaire, Mr. B. E. Sunny, an ordinary officer, has 17,500 shares of American Telephone & Telegraph Co. stock.

These are worth $2,500,000 now.

After the Western Union trade of 7 to 5, he may be justified in looking for a shrinkage.

I find from the book, that Mr. Vail is not the Moses but the "Monte Cristo" of the telephone.

As I understand it, Monte had a little vengeance to take care of.

After each victim was disposed of, a finger was held up to signify the successive number.

Monte Cristo Vail! Can it be that one of your fingers pointed upward is the licensee stockholder?

Can your second finger be the plight of Welles and other minority Western Electric stockholders?

Will your third finger indicate the minority stockholder of the Western Union Telegraph Company?

Monte Cristo had but three missions to perform.

He had money to burn.

What do you suppose your old Postal friends meant, when they hailed you over their cups as the Monte Cristo of the telephone?

Were they in earnest?

Surely not!!

We learn further, children, that the Bell has nothing to do with Wall Street.

We wonder why they are listed on the New York Stock Exchange.

Why does Morgan handle their gifts to the public?

They are not high financiers—O No!

Simply a democratized business.

No Vanderbilts or Astors are on the board.

But Murray Crane is.

By some fatuous course, he became a United States Senator.

Children—'tis well to have a friend at court.

Or a Senator at Washington.

"Doing nothing but scattering dividends."

Scattering seeds of sunshine all along your way!

Why, even the parent dividend check has a picture of Cupid, that little darling, talking over a telephone.

No wonder any Independent telephone invasion is resented.

No wonder they prayed daily that Elisha Gray should be disgraced, or should run across some ptomaines.

No wonder they called competitors "banditti"

They are so perfect!

Even at one time an officer contessed to being ashamed of sending out bills because lines were so noisy.

But they sent them out, and they were paid too.

Cupid was never careless while connected with this "Love one another" Company.

As time went on, the Western Electric Company began to hold up its pretty head.

It had a president who resembles President Eliot of Harvard.

You may know that the concern is altruistic—

That means no profit.

Art!

Beauty!

Class!

And the extraordinary feature of the Western Electric Company lies in its possession of 1,000 real "inspectors of quality."

Every inspector is carefully selected from Sunday school and college, and they certainly play safe in the quality of the men, anyway.

But they cost $3,000,000 a year.

Large inspection means loose workmanship.

It indicates high shop cost.

It means confusion.

It creates friction.

It causes discontent.

They are superfluous.

They are a detriment.

They undermine discipline.

They cause waste.

They indicate official madness.

And desired ruin.

And of course, our old friends, Drs. Competition and Duplication, are pulled over the bumps.

"New York was never developed by force of competition."

Only by the fear of it, children.

And that great bogie called "Failure", was hauled out to frighten you.

Actually 35 companies out of 15,000 have succumbed to the dread scourge of failure.

That is a percentage of 4-10 of one per cent.

The Bell widow has about forty children.

Michigan, Missouri & Kansas, Indiana, Illinois, and Ohio starved to death in the midst of plenty.

Three out of forty makes 7½ per cent.

"The Independents have done nothing to develop or improve switchboards."

"Automatic is experimental only."

Children, there is none so blind as he who will not see.

"No great men have been developed in the Independent field."

"But we have great (?) Bell leaders."

But it took an awful amount of money and publicity to make anyone believe it.

But, children, it is only near-greatness.

Photographs in many poses do not win battles, nor do they constitute lasting glory.

Children, all telephones not belonging to the grand one and Universal system are "cheap and nasty."

The word "nasty," according to Webster, means

"Disgustingly or excessively filthy or dirty in physical condition,—foul,—having filthy habits."

But hold a moment—here is what the author means:

"Difficult to handle,—vexatious,—annoying."

Possibly the author, having the job of saying Cupid-like things about the Bell, had to compromise.

One of the last lessons is the distribution of the dollar so begrudgingly given to the Bell company.

Every dollar you give is spent as follows:

Rent	$0.04
Taxes	.04
Maintenance	.16
Labor	.44
Dividends	.18
Interest	.06
Surplus	.08
Total	$1.00

Out of every dollar, it costs the Bell just 68 cents to give you service.

On every dollar you put in Bell securities, you are lucky to get back 6 or 8 cents in dividends.

Not all Bell properties pay 6 per cent.

Many of them pay nothing.

But after interest of 6 per cent is paid and you are allowed 6 per cent to keep you still, there is still 20 cents left for the controlling factors to use.

And they use it, too.

Western Electric Co. pays 8 per cent and should earn 40 per cent.

But these philanthropists need the money.

Most wonderful is the telephone!

It has made us into a nation of liars.

Children, the comet came and left disgusted.

The Welsh ponies and the Swiss cattle are still grazing peacefully in old Vermont.

The lion roareth,—

And the Whangdoodle mourneth,

"O, where is the tall grass to hide in."

MORAL: Seeing is believing!

A Telephone Coincidence.

A New York merchant, according to the Tribune, wishing to speak to his home, called on the telephone: "Give me X-351, please." Presently he heard, "There's your party." "Is that you, Minnie?" "Yes." "Doesn't sound like your voice. Whose house is this?" "This is Mr. Shepard's." "That's the house I want. Is this X-351?" "No, this is X-531." "And is your name Minnie?" "Sure!" "Well, ring off. My name is Shepard—there's a Minnie at my house, too, but my number is X-351," and the man reported to the telephone company that two men with the same name, wives of the same name, on the same "central," by the strange coincidence had the same number, transposed. What a chance for a humorous situation?

Frank H. Woods Favors Physical Connection

The following interview from the Lincoln (Nebraska) Star of October 10, in the main correctly states the position assumed in Nebraska, by Frank H. Woods, president of the Lincoln Telephone & Telegraph Co.

Mr. Woods believes that the public will demand, and has a right to demand, the broadest service which wire operating companies can furnish by adopting a system for the joint transmission of messages; that the public interest and the interests of telephone investors demand that such a broad service shall not be secured at the enormous price of throwing the telephone business into the hands of monopolists, and that under proper laws the good results of interconnection can be obtained without the evils of monopoly control.

He believes that the Bell telephone company can be made to obey the power of the law; that the American people are strong enough to enforce the law, and that now the telephone business is under the supervision of the Interstate Commerce Commission, and state railroad commissions in several states, physical connection can be secured on a basis of equity to Independent companies which has not heretofore been possible.

He stated to TELEPHONY that he wishes it emphasized that the Lincoln interview was given out strictly as a statement of his personal views, and was not intended to commit the national association, of which he is president, to this attitude. But he strongly believes that this policy will work to the advantage of the Independent companies, large and small.

Will Ask Legislation.

"Speaking personally and for a large number of Independent telephone men over the country, I wish to say that we are in favor of universal service. Representatives of the Independents will go before congress and the state legislatures asking for passage of laws to compel interchange of service among all companies and over all lines, local and long distance, state and interstate.

"The Bell company has constantly raised the cry of 'universal service and one system,' meaning thereby its own system. Now it will have an opportunity to prove its sincerity by joining with the Independents in asking for legislation to bring about universal service.

Bell Will Oppose It.

"There is little question, however, that the plan will be opposed by the Bell because it would enable competing companies to become established and to live. It would encourage local development not controlled by itself, and that is just what the Bell doesn't want."

"Will not this attitude by the Independents in favor of universal connection involve a change from the position they have taken heretofore?"

The Square Deal.

"The Independents have always been opposed to any interchange of traffic on such terms as might have been available in the past because they were not fair to us. It is only since public service commissions, state and national, came into existence or were given adequate authority to regulate telephone companies that there has been any prospect of compelling an interchange on a basis fair to both sides. So long as any arrangement which could be made remains dependent on the Bell's volition, it is not desired by the Independents.

"What we now propose to ask is that the federal and state commissions be clothed with ample power to enforce penalties against any company which will not exchange service on reasonable terms.

"The Bell policy has always been to interchange only with the Independents on terms which will benefit itself, such as tend to take business away from and weaken the Independent toll line system. At the same time, it has been keeping up the cry of universal service.

"Now, the only way to get universal service is to provide for an interchange of traffic among all companies. We favor connection of the two systems here in Lincoln for the interchange of local service on a message basis rate of 5 or 10 cents, as the state railway commission may determine to be reasonable.

"This interchange would yield each system about $25,000 additional revenue per annum.

"Besides this, we are in favor of joint connection with both systems on every local private branch exchange in business houses and hotels. At the present time the Bell in Lincoln serves the Lincoln hotel and the automatic serves the Lindell. Communication cannot be had between the guests of one hotel in their rooms with persons at the other hotel, or with telephone patrons in the city who do not have the same telephone. Many other instances similar to these could be cited. If every private branch exchange had connections with both systems, it would greatly facilitate business.

Plan Appeals to the Public.

"Under proper supervision by the Interstate Commerce Commission and state railway commissions, a general interchange of local and long distance telephone communication will surely give the public more satisfactory service. The only way to secure such general service enabling the patron, from his own telephone, whether Bell or Independent, to talk with all other telephone users, is to invest those bodies with power to compel it.

"While the public will derive great benefit from this legislation, if enacted, the companies will share in the advantages. They will secure from it a larger revenue through a system of message charges on interchanged traffic. This will obviate, to a considerable extent, the necessary increase in rates of local exchanges as they grow larger and extend over wider territory. It is a peculiar fact well known to all telephone men that the greater the area served and the greater the number of connections available to subscribers, the higher must be the scale of charges under the prevailing system of flat rates for unlimited service.

"Here it is in a nutshell: If all Lincoln subscribers were on one exchange having 20,000 telephones, the rates would have to be based on the opportunity given each subscriber to reach all of the 20,000. On the other hand, with two exchanges, having approximately 10,000 telephones, the subscriber to either one would need to pay regularly only for the service thus afforded, and occasionally, when needing to reach someone in the other system, interchangeable service would enable him to do so at a slight extra cost. He would be saved the expense of paying for service every day which he uses only once in a while.

"The plan which we favor will give the companies a revenue which they do not get now and will give the patrons a service they do not now enjoy. It will, in effect, give every telephone user cheaper service considering the increased number of telephones placed at his disposal."

Work of the Patent Office

By Max W. Zabel

TELEPHONE MOUTHPIECE ATTACHMENT.

A. P. Levi, H. Schlessinger, and M. Schlessinger, San Francisco, Cal., pat. 972,114, Oct. 4, 1910.

An antiseptic annular ring is provided upon the exterior of a telephone mouthpiece and communicates with the interior thereof through holes in the mouthpiece. Antiseptic material is placed within the ring.

TELEPHONE RECEIVER HANDLE.

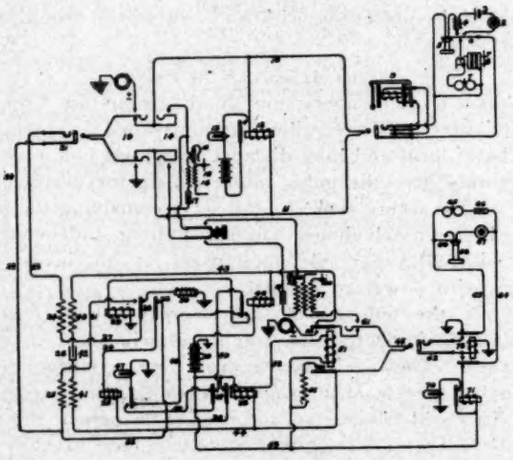
C. A. Barnes, Sr., Greenfield, Ind., pat. 971,961, Oct. 4, 1910.

A handle for holding a receiver has means to enclose a part of the receiver. The projecting handle is of such character that the receiver may be mounted upon or removed from the switchhook when desired.

TOLL TRUNK.

C. S. Winston, Chicago, Ill., pat. 971,651, Oct. 4, 1910, assigned to Kellogg Switchboard & Supply Co., Chicago.

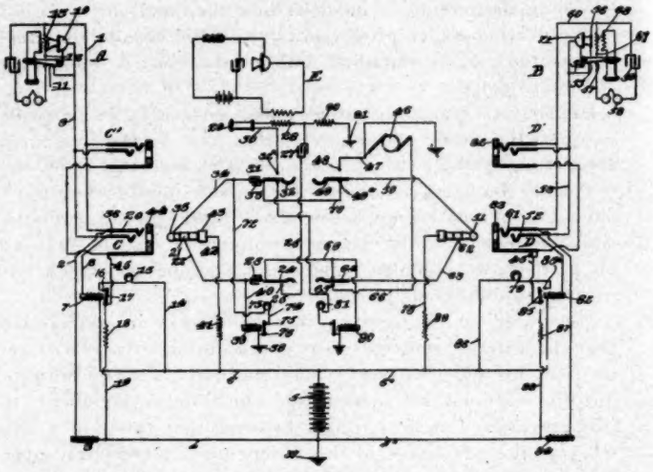
This invention is designed to relieve the work of the toll trunk operator in a common battery exchange so that the trunk operator need only test the desired line and insert and withdraw the trunk plug. The call comes in in the ordinary way, from the toll board, and the trunk operator completes the connection with the plug 45, thereby actuating the relays 38 and 73 to display signal 47 and later disconnecting the line relay 71. The trunk operator then inserts the calling plug, which upon insertion causes relays 35 and 12 which are of high resistance to be actuated but without actuating the relay 51, which is of low resistance. Thereby signal 47 is extinguished. The toll operator then performs the ringing by means of the key 19 which actuates the relay 51, thereby placing ringing current on the called line.



TELEPHONE SYSTEM.

A. H. Dyson, Chicago, Ill., pat. 971,598, Oct. 4, 1910, assigned to Stromberg-Carlson Telephone Mfg. Co., Rochester, N. Y.

This invention is designed to provide busy test arrangements which do not result in objectionable clicks in the calling subscriber's receiver. The invention is further designed to provide other new features in a system of this kind. The invention includes the substations *A*, *B*, the central battery 5, which through impedence coils 3 and 84 furnishes current to the line, line relays 7 and 82, and a cord circuit shunt for restoring the line relay. This shunt circuit is as follows: battery 5, through conductor 6, resistance 41 and finally through resistance 18, connection 19 and a conductor 4 back to the battery. The busy test circuit extends from the test ring through the plug tip 51, connection 50 to key 49, thence through contact 49*a* to

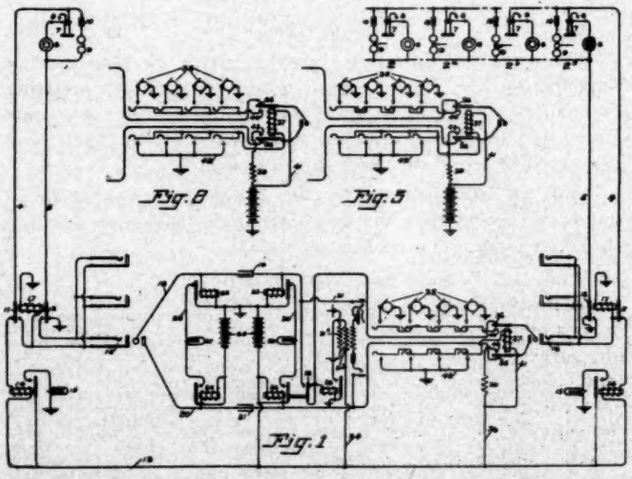


the key 32, through connection 30, receiver 29, resistance 90, connections 91 and 37 to battery 5, through connections 6*a* and 86, lamp 79 and resistance 89 in parallel, to ring 83, armature 85, ring 83 of the jack *D*, thence back to the tip 51. This busy test by virtue of the lamp circuit 86 88 operates to quiet the line in making a busy test.

FOUR PARTY LINE RINGING KEY.

A. H. Weiss, Chicago, Ill., pat. 971,650, Oct. 4, 1910, assigned to Kellogg Switchboard & Supply Co., Chicago.

The system herein disclosed is designed to eliminate a plurality of series contacts in the talking circuit normally introduced by a four party ringing key. This is accomplished electrically by the use of the relay 37, which is actuated whenever a ringing key is depressed, thereby connecting the desired generator 35 to the line. When the relay 37 is not actuated, the talking circuit is complete without including any contacts of the party line key, except contacts 36, 36.



Before Courts and Commissions

By A. H. McMillan

Injury from Falling Tree.

A workman of the Southern Bell Telephone & Telegraph Company, with other employes, was pulling down by a rope a tree that was being felled in an open space. The workman was under the direction of a general foreman over several gangs, and of an immediate foreman over the gang in which the workman was employed. The tree in falling struck and injured the workman. The workman having sued the telephone company, judgment was given against him on the ground that the danger was obvious and known, or should have been known, to him, and in the absence of an express contract on the part of the company to warn him when the tree began to fall and in what direction it would fall, the company was not liable. If the foreman was negligent it was held to be the negligence of the company. Hagins vs. So. Bell Tel. & Teg. Co., 68 S. E., 428.

A New Pole Rental Suit.

Shelby County, Tennessee, has sued the Cumberland Telephone and Telegraph Company for $9,432 for rental for poles on the county roads during the years 1908 and 1909, and it is apparent that a claim for half as much more for rental during the year 1910 is rapidly accruing. The account is based on a calculation of $1 per year per pole and it is stated that during each of the years covered by this suit the company had 4,716 poles on the turnpikes and dirt roads of the county. The bill of complaint recites that the poles were erected without asking permission from the county. It is related that in July, 1907, the county court made an order that the Cumberland company must agree with the county authorities as to the location of the poles and must agree to a maximum schedule of charges for service, fixed at $7.50 per quarter for residence telephones, and $15 per quarter for business telephones, otherwise the company would be charged a rental of $1 per year for each pole. The company was given until January, 1908, to comply with this order. The bill filed says the company has never accepted this proposition; that it has only partly complied with the requirements of it in the matter of the location of the poles, and that in the matter of charges the company has gone far above the rates fixed by the county.

Impossibility Does Not Excuse Performance of Connection Contract.

The Gravel Switch & Little South Telephone Company, of Gravel Switch, Ky., and the Lebanon, Louisville & Lexington Telephone Company entered into a contract in 1902 for the physical connection of their lines in the city of Lebanon, Ky. It was provided that the contract should remain in force until the expiration of thirty days, after written notice of intention to terminate the same, given by either party to the other, unless sooner otherwise terminated. The two companies worked under the agreement until July, 1908, when the city council passed an ordinance requiring the Lebanon company to remove its poles and wires from the streets of the city on the ground that its franchise was not sold to the highest bidder as required by Section 164 of the Constitution. Then the Lebanon company refused to do business with the Gravel Switch company, and the latter brought suit to recover damages for breach of contract. The Cumberland Telephone & Telegraph Company was made a defendant on the ground that it owned all the stock in the Lebanon company and was operating the lines under that name. The Lebanon company answered, alleging that it had only a license to maintain its system in the city, which had been revoked, and hence it could not perform its contract. It had given no previous written notice, but the court held that the answer itself was notice sufficient to terminate the contract from its date. The contract was held legal and binding, even though the city had revoked the license and rendered performance impossible. A judgment against the Lebanon company for damages for breach of contract until the date of the answer was therefore upheld, but it was decided that the Cumberland company was not liable in any way as a stockholder of the Lebanon company. Gravel Switch & Little South Tel. Co. vs. Lebanon L. & L. Tel. Co., 129 S. W., 559.

Ownership of Trees Between Lots and Sidewalk.

In Mississippi adjacent property owners also own the trees growing in front of their lots and between the sidewalk and the street. At Meridian, the Meridian Home Telephone Company cut trees so situated and the property owner brought suit against the company, which justified its action under authority of the city. The supreme court of the state held that the company had no right to cut such trees and that the city had no power to give the company any such authority as it claimed. A judgment that had been directed in favor of the company by the circuit court was therefore reversed. The court, discussing the ownership of the trees, said: "The trees are the property of the adjacent owner as absolutely as if they grew in a forest." The court held that the company was liable under section 4977 of the code of 1906, which provides that if any person shall cut down, deaden or destroy any tree, etc., he shall pay the statutory penalty. Brahan vs. Meridian Home Tel. Co., 52 So., 485.

Right to Disconnect Rival's Telephone.

A short time ago we wrote for a copy of TELEPHONY containing a court decision in regard to whether or not a telephone company has a right to discontinue the service of a patron who accepts the agency for a toll line that was connected to the company's switchboard, and then makes use of the company's telephone to call subscribers to come to his place of business to answer calls over the toll line. This company connected with the Bell company before there was any Independent company here and had a contract with it to receive 10 cents as a connection or messenger fee for all "in" messages. About a year ago the Bell company wanted to change our contract to 5 cents, which we refused to do. But in July it induced a druggist to take the agency for its toll line, so it disconnected from our board, and the druggist, being one of our patrons, commenced using our system to call patrons to come to his store to answer calls over the Bell line. We notified him that if he used our lien for that purpose we would discontinue his service, but he kept right on, so we cut out his telephone and told him he could not have it unless he paid us extra for such service. But he refused to pay more than the regular rental. Did we have a right to discontinue his service, or can he compel us to reinstate it without paying us additional as long as he wants to use our system to do a competing business with us?

We think you are right in disconnecting service of the agent of your competitor and that he cannot compel you to reinstate him unless he agrees not to use your system to do a competing business. We do not find the case you mention as having been reported in these columns about a year ago. In the *American Telephone Journal* for September 9, 1905, the case of People vs. Central Company, **58 N. Y. S., 221,** was mentioned. That was a case in which a telephone company was asked to install a telephone in its competitor's office under the statute requiring telephone companies to transmit messages to other companies. The court refused to compel the installation of the telephone because the statute imposed a penalty. This was held to be an adequate remedy and exclusive of any other.

Ideas of the Workers

Removing Induced Static Currents from Wires Parallel to 33,000 Volt Line.

A high tension line, 33,000 volts, three phase, 25 cycle, parallels a telephone and telegraph toll line of which I was in charge some time ago; the connections are shown in Fig. 1. This power line is 78 miles distant and the telegraph and telephone line is just 50 feet from the high tension line. They

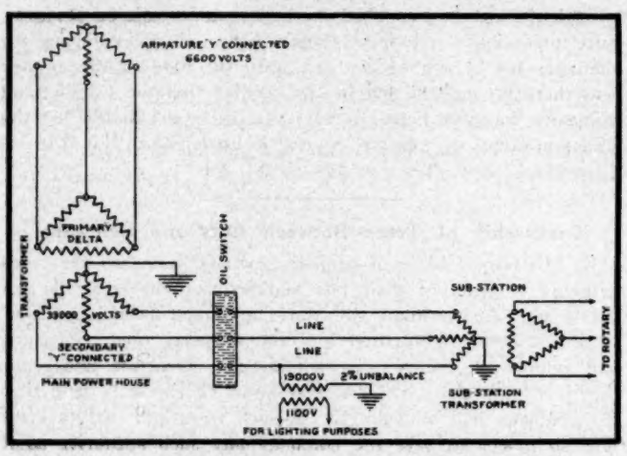


Fig. 1. Connections on Slightly Unbalanced Three-Phase, 33,000-Volt Circuit Parallel to Telephone and Telegraph Lines.

cross each other 10 times during the 78 miles. The telegraph and telephone line is always under the power line at the crossings. It is protected by a 10 pin arm, which is placed on the telephone pole over the working telephone lines; five guy wires are run from each of these arms, all tied together, and grounded at each pole. This device also serves to drain the induced static charges from the telephone lines. The high tension poles run 40 to the mile and the telephone poles run 60 to the mile. There are three turns made in the power line every 10 miles, making one complete transposition in 10 miles. The break-down test of the insulators used on this line is 66,000 volts.

Visible Static Discharge.

One will notice by the manner in which the secondaries are grounded that it is only necessary to insulate for a voltage a little over 19,000 volts. In damp, swampy districts one can hear and see the static discharges. The poles used on this line are from 75 to 90 feet in the air. This line was put in service at the hottest and dryest time of the summer season, therefore, with the large insulators supported on 18-inch bolts on the crossarms and the hot, dry season, this line had an ex-

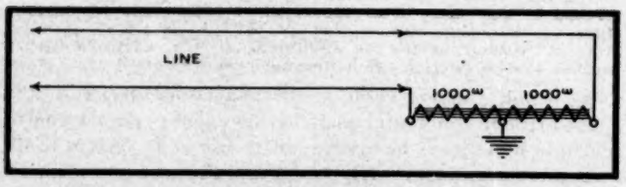


Fig. 2. Retardation Coils Connected From Line to Ground Providing Path for Removal of Static Electricity.

tremely high insulation resistance. These wires were three feet apart.

We had a 120 pair common battery trunk cable on the telephone poles. Soon after the high tension was put in service our troubles began. We were flooded with trouble reports. The first thing to do was to determine what was causing the lines to be so noisy. After considerable discussion and many arguments, I decided it was a case of electromagnetic induction pure and distinct. We fed battery and ground to our telephone lines. While the ground is for various testing circuits, it is also on the lines, and caused the trouble.

False Signals Caused by Static Induction.

The first thing we did was to change all the common battery trunks to ring-down trunks and all the common battery subscribers' lines to magneto service. This cleared up the trouble for a while. The next report received was that the operators at both ends of the line were receiving calling signals and when they answered they would either meet each other or find no one on the line. This was another one on me, so I covered this line the whole distance, and was surprised when I got in the swampy district, where the air is always heavy with mist, to hear and see the fire flashing in the air. I at once concluded that this noise must be the static discharges, and that these were the cause of the central offices' signals flashing. I then tried various experiments and during the course of these experiments I pulled a pair of carbons out of the main frame. The shock I received was so strong, and my muscles contracted with such a jerk that I jumped and fell to the floor about eight feet away from the main frame. This proved to me without a doubt that there was "juice" on these wires, and I figured that they were getting it from the static discharges of the high tension line. To get this current off and keep it off, I got some ground glass and drew a heavy lead pencil stroke across it from end to end. Then I wrapped each end with tin foil and soldered a wire to each end of the tin foil and shellaced the whole thing.

I then connected one end of the glass to one of the line

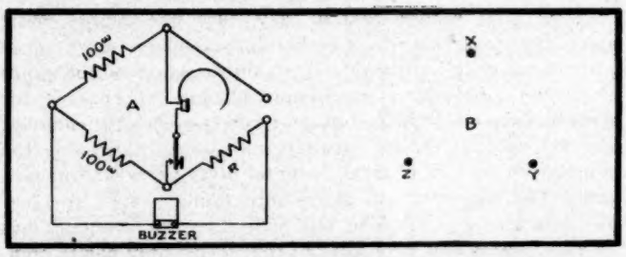


Fig. 3. Methods of Determining Ground Resistance with Bridge and Three Rods.

wires and the other end to the ground, and awaited developments, going into the exchange and watching this particular trunk. The results were very satisfactory, as the operator did not have any more trouble from false signals on this trunk. This was, however, only a beginning. We had 60 toll lines on which we were having the same trouble, but I was now in a position to know what to do.

Grounded Coils Took Off Static.

I had 60 balanced 1,000 ohms retardation coils made and connected one to each line as shown in Fig. 2. I did this at each end of the line, thus draining the static current from the lines to the ground.

Induced Current Fused Protector Mountings.

I forgot to mention that three times the static discharge induced from the high tension was of such a high potential that in arcing across the mica air gap between the carbons in the protector mountings it melted the brass carbon holders into a solid mass. No more trouble of this kind was experienced, however, after the retardation coils were connected to the line.

How Good Ground was Obtained.

In grounding these coils, I took a lot of care in selecting a good ground, and to determine how good it was, that is, if it was free from resistance, I used the following method:

First I took three 6-foot ground rods and formed an equilaterial triangle, and then drove the rods into the earth as in Fig. 3-*A*. A bridge was connected as in Fig. 3-*B*.

The first step was to measure resistance of X and Y; then measure resistance of Y and Z; and finally to measure resistance of Z and X.

Say X and $Y = 60$ ohms.
Y and $Z = 50$ ohms.
Say Z and $X = 40$ ohms; then
$X + Y = 60$ ohms.
$Y = 60 - X$.
$60 - X + Z = 50$.
$Z = 50 - 60 + X$.
$Z = -10 + X$.
$X - 10 + X = 40$.
$2X = 40 + 10 = 50$.
$X = 25$.
$25 + Y = 60$.
$Y = 60 - 25 = 35$.
$Z + 25 = 40$.
$Z = 40 - 25 = 15$.
The resistance at X, then, is 25 ohms.
The resistance at Y is 35 ohms.
The resistance at Z is 15 ohms.

This method was used by the cable department up to the

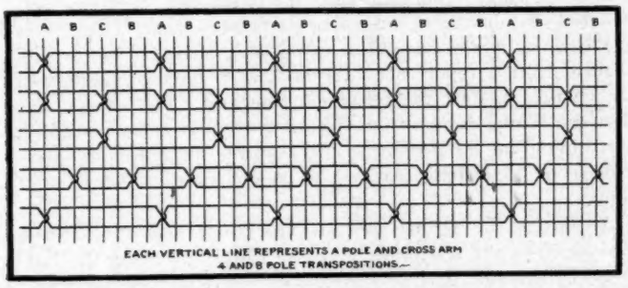


Fig. 4. Plan According to Which Line was Transposed in Section Parallel to High Tension Wire. Poles Run 30 to the Mile.

time I left this company for determining earth resistance, and to determine where it was best to set up a new terminal pole in order to get the best ground for the protection ground wire.

Coils Removed After Fourteen Months.

To get back to the original subject, after the high tension line had been in service about 14 months, we found that we could remove the coils with safety. I presume the insulators and cross-arms had become dirty enough from the smoke of locomotives and factories to allow the static discharges to escape to earth.

Occasionally, however, trouble was experienced on three or four trunks, but as soon as the coils were put in service the trouble ceased. I am informed they have had no trouble for the last year.

John King Langham.

Making Outside Testing Points Safe for the Worker.

I have often wondered why the different telephone companies do not take more care of their outside test points and cable terminals, so that troublemen will not dread going out on work assigned them, particularly to cable boxes located on high poles poorly stepped and loaded with a heavy line, high tension wires and transformers. After arriving at the top of a pole a man finds a miserable, stingy little seat not large enough to stand on and without guard rails to keep him from falling should he receive a shock, or make a misstep, while taking out fuses, carbons or tracing wires.

Is it any wonder that linemen and inspectors are careless and do not take interest in the condition "the blamed old junk box" is in? They know that none of the "officials" are going up these poles to see how things look. They would not risk the fall and run the chance of being killed or crippled for life. "That is what they pay the linemen for."

It is a case of "get through as quickly as I can and with as little work and risk as possible." And the next man on trouble does the same. Result, poor wiring, loose connections, noisy lines, loss of business. Who wants to talk over noisy wires?

In conversation with a lineman a few days ago he told me that last winter he had been working on one of these high poles, with no chance to work properly, exposed to the cold wind until he was frostbitten, and had the time of his life getting back to earth. It was the only time in his life that he did not care if he lived or not. Imagine the condition the cable box was left in. This man has been in the business twenty years and he is only one of the many who have the same experience.

Under such conditions is it any wonder we have troubles on the line. I know of one instance where I made an inspection of a cable box, and found out of 40 wires 35 loose connections and resin joints; another case, 22 loose fuses out of 40.

If a wood box is used, why not have a good sized one, not more than 25 ft. from ground, and below all wires and crossarms, with doors opening from the center both ways, plenty large enough to break the force of the winds and storms, where a man is sitting or standing on the seat. Let the seat be equipped with a good strong guard rail. The man whose duties call him to such a box will do much better work than when he goes to the box poorly situated and equipped. There is always plenty of room 20 ft. from the ground for as large a box as any need be to contain all apparatus and proper wiring. The difference in cost of installing good, practical, sensible apparatus will soon be wiped out by more calls over good talking wires.

The telephone officials will soon find they are getting better transmission and fewer line troubles. If they will also believe, as a great many other corporations have learned, that "the man behind the gun" is the man to encourage and help, they will find their business will increase and their lines and equipment be kept in better condition.

One of the Workers.

Mr. S. Refuses to be Downed.

We thought that Mr. Davis from Arkansas had wheels in his head, but we find that he only had too many springs on his generators. In the interest of good service we suggest that he remove the insulation between the outer springs and thereby eliminate trouble from stiffly working generators as well as give the curtains a chance.

S. from Missouri.

Will the third and final round introduce Mr. H. N. Faris —also from Missouri?

Western Pennsylvania Independent Association Will Hold Meeting at Johnstown Next Week.

The Western Pennsylvania Independent Telephone Association will hold its eighth quarterly meeting at the Merchants Hotel, Johnstown, Pa., October 20 and 21. An interesting program has been arranged, and visitors are assured of a pleasant social time as well as receiving helpful hints. This organization has the reputation of always holding interesting meetings, and the coming event will be notable.

Events in the Field

Conventions; Western Pennsylvania Association, Merchants Hotel, Johnstown, October 20, 21; Texas, Dallas, October 26, 27; Canadian, Toronto, November 17.

Dissolution of Morgan Injunction in Cleveland Followed by Eastern Investment in Securities.

Action was taken in the court of common pleas at Cleveland, October 7, by which the fight against the control of the United States Telephone Co. by J. P. Morgan and Co. is brought to a close. The injunction standing against J. P. Morgan and Co. was dissolved and the firm was dismissed as a defendant in the action brought by H. B. McGraw, attorney for the minority interests of the United States Telephone Co.

Parties most directly interested in the matter in Cleveland refused to talk concerning the action, but it is taken for granted that most of the Independent leaders are satisfied with the statement of J. P. Morgan and Co., to the effect that the Ohio telephone properties were purchased by him for an investment. Some time ago the plaintiffs in the action insisted that Morgan and Co. make an answer which was given in the statement as published in last week's TELEPHONY.

The dismissal of the injunctions will make it possible for the annual meeting of the company to be held and the formal action of transferring the headquarters from Cleveland to Columbus will be made. The annual meeting of the United States company was called for last winter, but because of the injunction postponements were made from time to time. Practically, the headquarters of the company have been removed to Columbus, but the formal steps have not been taken. The annual meeting was to have been held at Cleveland last week, but this was before the dismissal of the suits and another postponement was taken. The date for the meeting has now been fixed for October 31.

Last week conferences were held between representatives of the complainants and Charles A. Otis, president of the Cuyahoga Telephone Company. For the past two months rumors have been current that a friendly settlement of the pending suits were to be made. Part of the suit still stands, as the original petition was not dismissed.

Frank A. Davis, president of the United States Telephone Co., was in New York all last week confering with Morgan and Co. It is believed that since the dismissal of the suits authorization of improvements and extensions on a number of the Morgan properties in Ohio will be made, and some of the work may be done this fall. Before leaving Mr. Davis made the statement that such was the purpose of the company.

One of the incidents of the dismissal of the suits was the large number of buying orders for United States Telephone and Cuyahoga stock filed with members of the Cleveland stock exchange. Most of the orders were traced from the east.

Building Activity Likely to Increase in Texas.

The establishment of many new towns and the rapid growth of the older settled communities offer opportunities for the establishment of many new telephone exchanges and the construction of long-distance lines in Texas. This field is being occupied chiefly by the Independent telephone interests, although the Bell concern has not been slow about invading the rapidly developing territory. The prospects are favorable for much activity in Independent telephone development all over Texas, particularly in the former ranch region of western and southwestern Texas, during the next few months. In a number of localities private ranch telephone lines, some of them many miles in length and equipped with modern appliances, have been taken over by other interests and converted for public use.

The older Independent telephone companies in the state show evidence of prosperity. They have placed their respective systems upon a sound and substantial basis. In most instances they occupy exclusive fields, but in the larger cities they have Bell competition. The Independent long-distance concerns serve large territory, with many local exchanges. Some of the Independent companies have gradually extended their systems until they have several hundred miles of lines.

The pioneer work in the telephone field of Texas is done by the Independent concerns. They are the first to provide exchanges for the new or growing towns; they are the first to give these places telephone connection with the outside world, and they are ever alert to serve the best interests of their patrons.

There is general activity among the Independent concerns in the matter of making improvements and repairs in their respective systems and exchanges. Many extensions are planned for the coming year. It is also expected that a large number of new exchanges will be established in different parts of the state.

Latest Developments in Louisville Party Line Controversy.

The latest development in the campaign begun a short time ago by Louisville newspapers against the Louisville Home Telephone Company, charging that the telephone company was violating its charter by installing party lines, came a few days ago when a special committee comprising members of the city council made a report upon the matter; it having investigated the charges against the telephone company. The report says that the Home company is violating its charter by installing party lines, but the document also absolves the telephone interests from all other breaches of its contract at the present time.

As far as the Home officials are concerned, the case is quiescent, as the telephone men are simply awaiting the outcome of the suit that City Attorney Clayton B. Blakely has filed against the Home company, as an attempt to take away its charter. Mr. Blakely informed the members of the council recently that he had begun prosecution of the suit in question.

Increased Cost of Operation Reason for Higher Rate.

The Elyria Telephone Company, of Elyria, Ohio, has issued a circular letter to the business houses and offices of that city, notifying the subscribers that on November 1, the rate charged for business telephones would be advanced fifty cents.

The company claims that the increased cost of material warrants an advance in the price charged for telephone service on account of the relative increase in the cost of maintenance, and that the new rate will equalize the rates now in effect in private residences as well as in stores or offices.

Inasmuch as a business telephone records many more calls per day than a residence telephone, the difference in the rates is not sufficient to bring the calls on the same footing as far as the cost of service is concerned. The business man is benefitted by the extension of telephone service, says the company, which calls attention to the fact that with the aid of twenty miles of cable, the number of telephones connected with the exchange, have increased from 848 in 1902 to 2,088 September, 1910.

The company is confident that the telephone users will not complain in regard to the raise in this particular rate, as it is only through the co-operation with the business men of the city that it can expect to improve and extend the local system.

Bell Company Will Pay Damages for Failure to Deliver Message.

A short time ago the Cumberland Telephone Company, at Madisonville, Ky., received a call from the state prison at Eddyville to the father of one of the inmates of the prison, saying that the son was dying and urging the father to come immediately. The call was given over the telephone by the prison physician, who asked that the toll charges be placed to the account of the state in the Cumberland offices. However, the Cumberland officials refused to advise the father of his son's death, asserting that the physician's request was not contractual and that they might not, therefore, receive payment for the call.

Upon learning that the Cumberland refused to deliver the message, T. L. Jones, father of the dead boy, entered suit against the company, and his action was sustained by the Court of Appeals of Kentucky, the court ruling that the state was liable for payment for such calls of imperative need and that the Cumberland company is liable for damages, on account of its refusal to honor the verbal contract of the prison physician.

In Independent telephone circles the policy is to charge any subscriber with a telephone call if he makes the request over the telephone, and the verbal request is considered as a contract. In line with this agreement, the failure of the Cumberland company to honor the verbal contract with the state's physician is justifiable grounds for damages.

In the case of the Home Telephone Company, of Wabash Ind., vs. the North Manchester Telephone Company Judge Hadley, of the appellate court of Indiana, in affirming the judgment of the Delaware circuit court held, (1) *That a written contract entered into between two Independent telephone companies serving a territory previously served by one large company that had a practical monopoly (The Central Union Telephone Company) by which one of said Independent companies (The North Manchester) agreed to give the other all its toll business directed to points on the latter's lines, was for the purpose of extending trade, and not in restraint thereof, and was, therefore, valid and binding.* (2) *That the decree of the lower court enjoining such company from violating the terms of said contract and enjoining it from transmitting telephone messages or business over rival lines and exchanges when said messages were to parties having direct telephone connection with plaintiff's lines or its connecting lines, it was not error to issue such decree in such case.* (3) *That large expenditures by plaintiff in putting in cedar posts and a metallic circuit, etc., in order to fit itself to carry such toll business and its undertaking to do s, and the fact that such a business arrangement is essential to the existence of said Independent companies, afforded sufficient consideration for such contract.* (4) *That the trial court judgment does not compel a severance of the connection between appellant and all other telephone companies nor prohibit it from receiving and transmitting messages delivered to it from other companies but it does preclude the right to insist on an exclusive contract for the mutual use of the two lines for toll service.*

The opinion was filed October 4.

INDEPENDENT EXCLUSIVE CONNECTION CONTRACT DECLARED VALID.

Physical Connection Impracticable, Declares Los Angeles Board of Public Utilities.

The Board of Public Utilities of Los Angeles, Cal., has reported to the Council that interchange of service between the two competing companies there is impracticable.

"The mechanical and other obstacles," says the report, "together with the added capital outlay required, appear to make prohibitive any satisfactory installation for this purpose, which has never been successfully used."

Bell Company in Trouble in Kentucky's Capital.

A hot-bed of revolution against the East Tennessee Telephone Company, a Bell line operating at Frankfort, Ky., has been stirred up in the Bluegrass capital. A short time ago Mayor Polsgrove, of Frankfart, offered two telephone franchises for sale, there being no franchises in existence in Frankfort prior to a few months ago. The Frankfort Telephone Company, an Independent concern, purchased one of the franchises, but the Bell line declined to make an offer. The act aroused the city authorities, and Mayor Polsgrove immediately swore out two warrants against the East Tennessee company, one charging it with operating in the city without a franchise and the other charging that excessive rates are being demanded by the East Tennessee company for telephone service.

The cases will be tried before Judge Herndon, of the Frankfort Police Court, and after trial in the lower courts will come up before the Court of Appeals to oust the company. Scott and Hamilton, two prominent attorneys of Frankfort, have been employed by the city to assist the city attorney and a warm legal struggle is promised when the case appears in the court of last resort.

Kentucky Independent Association District Meetings.

There promises to be considerable activity in the ranks of the Kentucky Independent Telephone Association within the next few months, as three separate conventions will be held under the auspices of the organization. The western district of the association will hold a meeting at Paducah, Ky., during the latter part of October. It is expected that the meeting will be attended by every telephone man in the western part of the state.

The date for the eastern section's convention has not been definitely decided upon, but it will occur some time during the early part of November. The big state convention of the association will be held in Louisville in December and a number of projects for the extension of the organization will probably be suggested.

The above announcements were made by President E. M. Coleman, of the Louisville Home Telephone Company, who is chief executive of the state body.

State Telephone Map of Oklahoma Being Prepared.

George P. Player, telephone expert of the corporation commission, at Guthrie, Okla., is preparing a telephone map of the state, which will be of very great value both to telephone men and to the general public. The map is being prepared by counties. A map of each county is sent to each telephone company operating in a given county, with the request to trace its lines thereon, showing the routes along section lines, and the points where connections are made with other lines. When completed it will be gotten out in regular map form for general distribution. It will enable the business man who has to get telephone communications with various parts of the state to tell at a glance just where there are telephone lines; what particular lines serve the various towns and what connections can be made. The map will also show the valuation of the telephone lines in each county. There are about 700 Indepndent companies operating in Oklahoma, in addition to the Pioneer company, with 100 exchanges.

The Need of a Sound Financial Policy in Managing Telephone Properties

By Frank F. Fowle

It is an axiom that every business needs, in the long run, an amount of capital proportional to the volume of its trade or substantially so. This is particularly true of public utilities, where there is a large investment in a permanent plant. The condition of rapid growth and expansion brings out this truth in a forcible manner, and therefore we find that it bears with great importance upon the telephone industry, which is growing at a rate surpassed by few, if any, other public utilities. An editorial in TELEPHONY of April 9, 1910, dealt with this question vigorously but briefly and as it has such a broad bearing upon the successful management of Independent systems it seems worthy of considerable elaboration. The failure or inability to raise the needed capital in a rapidly growing business may be due to a variety of causes, some perhaps of a merely temporary character, such as a depression of the security market, while others are more permanent, such as the adoption of an unsound financial policy.

It is not here the purpose to dwell on all of these features, but to emphasize the need of a proper financial policy, one which recognizes all the facts and faces the issues squarely, in contrast with a policy too often prevalent of successive makeshifts, producing only temporary relief and ultimately leading to an unsuccessful conclusion. A study of this question is necessarily bound up with other considerations, such as methods of accounting and bookkeeping, cost records, engineering questions and matters of business policy. It will be helpful therefore to take a suppositional specific case as a basis of discussion. Concrete figures are always understood more readily than generalizations, and they serve as a ready means of drawing conclusions in a convincing way.

We shall assume for our purpose a plant which cost $25,000 at a period of say ten years ago, and now has a value of $70,000; this value will be assumed to include land, buildings, central offices, lines, stations, furniture, fixtures, tools, teams, stores and supplies, and the cost of organization and engineering. We shall also assume that this plant was financed originally in a way that would now be considered only proper, by a stock issue of $25,000 fully paid; without casting any reflections, it may be said that other methods were not at that time and earlier considered improper, but it is not the purpose here to discuss that phase of the subject. The balance sheet at the opening of business might appear about as follows:

ASSETS.	
Plant investment	$25,000.00
Accounts receivable	29.31
Cash on hand	347.94
Total assets	$25,377.25
LIABILITIES.	
Capital stock	$25,000.00
Accounts payable	377.25
Total liabilities	$25,377.25

Fig. 1. Balance Sheet at Opening of Business.

We shall next assume certain definite additions to the plant each year, and certain definite annual revenues, expenses and net earnings, in order to trace clearly the later disposition of these net earnings and the sources of the funds invested in the plant extensions. The table of plant values, revenues, expenses and net earnings next presented is made up simply for convenience in this discussion, and represents what might fairly occur in a small telephone property under certain conditions. It is wholly fictitious so far as it relates to the actual figures of any plant.

Year.	Plant Investment.	Revenue.	Annual Expenses.	Net Earnings.
1	$25,000	$5,000	$3,500	$1,500
2	27,000	5,400	3,800	1,600
3	30,000	6,300	4,300	2,000
4	34,000	7,100	4,800	2,300
5	38,000	8,400	5,500	2,900
6	44,000	9,700	6,200	3,500
7	48,000	11,000	6,900	4,100
8	54,000	12,400	7,700	4,700
9	60,000	14,400	8,800	5,600
10	70,000	17,500	10,500	7,000
Total		$97,200	$62,000	$35,200

Fig. 2. Table Showing Annual Investment, Revenue, Expense, and Net Earnings for Ten Years.

This table shows an average investment during ten years of $43,000 and average net earnings of $3,520, or at the rate of 8.15 per cent, a sum insufficient to care for depreciation and pay more than 2 per cent to 3 per cent on the plant investment; the tenth year of operations shows some improvement over this, the net return being at the rate of 10 per cent, but still insufficient to pay a reasonable return on the plant. The conclusion is that either the management is extravagant or the rates are too low; it may be both. The matter of low rates is the more difficult one to remedy, however, and is always a vital problem.

Let us examine the situation which the directors of this company found themselves in during the early years of operation, supposedly. They would not expect, probably, any need for additional capital for a few years, and as a matter of prudence there might not be any objection to putting the net earnings back into the business, to postpone the day of new financing. But the rapid growth of the business was not a thing they had reckoned on, nor did they perhaps ponder over the fact that in order to properly protect the investment already made it would be necessary to find in some way the new capital for the extensions which the public would demand.

Generally speaking, the policy of turning net earnings back into a business during its early years is looked upon as prudent and wise, if the ultimate returns then expected seem to justify it. In that way a business is sometimes built up to have a value much above the original investment. This is all very well for purely private enterprises, but it leads to complications in a public utility business if long pursued, as we shall show. During the first five years of assumed operation, in Fig. 2, the net earnings amounted to $10,300, and the plant extensions called for $13,000. Assuming that no new capital was floated, this necessitated the borrowing of at least $3,000, that would probably be obtained from local banks or individuals, on notes bearing about 6 per cent interest.

At this time it may be assumed that the stockholders began to expect dividends. On the other hand the plant extensions had absorbed the entire net earnings and in addition necessitated a small loan. To be sure the value of the stock would theoretically have been enhanced considerably above par, on the basis of invested assets; but nevertheless it would not find much of a market in view

of the poor dividend record. That is to say, it would have a high intrinsic value, but a low market value. Let us assume that at this stage it was found feasible to float a bond issue. On the basis of the fifth year's operations, the net earnings, less 6 per cent interest on $3,000 of notes, were $2,720. A bond investor looks for security both as to principal and interest; there must be an ample margin of plant assets above the face value of the bonds, and the net earnings should be at the very least equal to twice the interest charges. On a conservative basis, the net earnings would justify an issue of $15,000 of 6 per cent bonds, which ought to sell at par. Assuming that they brought this figure, the treasury would be reimbursed by $15,000.

Telephone bonds have too often sold at heavy discounts, as low as 75 or 80; this in almost any business would indicate substantial weakness somewhere, in the interest rate, or the margin of plant assets or net earnings. In the telephone field, however, due weight must be given to the effects of the financial warfare which has been waged with a view to weakening the market for such securities. In any event it is a poor policy to raise capital under such circumstances, and some other recourse should be had if possible where the terms under which a bond may be marketed are so burdensome. When times are prosperous and credit is expanded, the interest rates are high owing to the demand for capital; it is then better policy to issue stock or notes. In times of depression, investors are usually more cautious and seek security in investment rather than high returns; under these conditions a bond issue is usually the most feasible way of raising capital.

We shall next assume that our plant passed through the succeeding five years without further new capital. This being the case, it is apparent that the plant investment at the end of the tenth year had been derived from the sources shown in the table below, in figure 3:

Original stock subscription	$25,000.00
Diverted from net earnings	27,000.00
Sale of notes	3,000.00
Sale of bonds	15,000.00
Total	$70,000.00

Fig. 3. Sources from Which Were Obtained Funds to Build and Extend the Plant.

The bond issue would not presumably be sold all at once time, but as needed, in order to save interest charges. As the net earnings will now be reduced by interest charges, we may prepare a new table to show the disposition of surplus earnings and the proceeds from note and bond sales, year by year:

Year.	Net Earnings.	Sales of Notes and Bonds.	Interest Charges. 6%	Surplus Earnings.	Plant Extensions.	Unexpended Surplus.
1	$1,500	.....	.....	$1,500	.....	$1,500
2	1,600	.....	.....	1,600	$2,000	1,100
3	2,000	.....	.....	2,000	3,000	100
4	2,300	$2,000	$120	2,180	4,000	280
5	2,900	1,000	180	2,720	4,000	....
6	3,500	5,000	480	3,020	6,000	2,020
7	4,100	5,000	780	3,320	4,000	6,340
8	4,700	5,000	1,080	3,620	6,000	8,960
9	5,600	.....	1,080	4,520	6,000	7,480
10	7,000	.....	1,080	5,920	10,000	3,400
Total	$35,200	$18,000	$4,800	$30,400	$45,000	$3,400

Fig. 4. Table Showing Disposition of Surplus Earnings and Proceeds from Note and Bond Sales.

The table in Fig. 4 shows that the surplus earnings of $30,400 in ten years were reinvested in the plant to the extent of $27,000, leaving an unexpended surplus at the end of the tenth year of $3,400. The latter is equal to 13.6 per cent on the capital stock of $25,000, or hardly sufficient for two annual dividends of 7 per cent. Surely this is a poor return for ten years of operation. And, moreover, the demands of the business for new capital have been such that under the circumstances no provision could be made for depreciation. Yet the plant is ten years old, that is, the original portion of it; and the unexpended surplus or reserve is by no means equal to rebuilding the oldest or original lines and equipment. Before we analyze the situation further we may consider the probable appearance of the balance sheet at the end of the tenth year, as given in Fig. 5.

ASSETS.	
Plant investment	$70,000.00
Accounts receivable:—	
Subscribers	1,135.50
Other companies	95.43
Miscellaneous	9.21
Cash on hand	2,287.09
Total assets	$73,527.23
LIABILITIES.	
Capital stock	$25,000.00
Bonds	15,000.00
Notes	3,000.00
Accounts payable	127.23
Surplus	30,400.00
Total liabilities	$73,527.23

Fig. 5. Balance Sheet at End of Tenth Year.

The fact that there is an unexpended surplus of $3,400 is not at once apparent from this balance sheet, in Fig. 5, but it will appear from analysis of the current assets and current liabilities; the former is composed of accounts receivable and cash, which equal $3,527.23; the current liabilities include here nothing but accounts payable, $127.23; the balance of current assets in excess of current liabilities is, therefore, $3,400, which comprises $2,287.09 in cash and $1,112.91 in outstanding accounts.

This balance sheet has been built up from ten years of operation upon the assumption that no dividends were paid. It is obvious that only a very small average dividend, in cash, is now or has been, possible.

Referring briefly to the subject of dividends generally, it may be observed that there are several methods of distributing the net profits among the stockholders. A dividend in cash is the usual procedure under normal conditions, assuming it to have been earned. Another form of disbursement is a stock dividend, usually resorted to when the earnings have been unusually large. The latter procedure amounts to capitalizing a part or the whole of the surplus. It serves only the purpose of making it subsequently appear that the net earnings are not excessive, as might otherwise be inferred. A share of stock is merely a certificate of pro rata ownership of the net assets; the pro rata ownership is not affected by the number of stock certificates which any stockholder possesses, but is determined by the ratio of his holdings to the total stock outstanding.

Still another form of dividend is termed a script dividend. No cash is disbursed, but each shareholder receives a certificate of indebtedness which certifies that his dividend has been loaned back to the company at interest, for a stated period and at a certain rate. This script then becomes one of the company's liabilities, just as any other loan, and if the company is on a sound basis the stockholders are fully protected as regards their dividends and interest on the loan. This expedient, however, is usually employed only in times of financial stringency, temporarily. At any other time it is a sign that the company is not in such condition that it can obtain capital on favorable terms.

To return to the specific case under discussion, the principle of finance which has been violated in this case is one of basic importance; it may be stated as follows: The capital liabilities, comprised of stock and bonds, should be

equal substantially to the invested assets plus a fair amount of working capital. That is to say, in the present instance, if the plant investment is actually $70,000 and a fair amount of working capital is about $2,000, then the amount of outstanding stock and bonds should be $72,000. Contrasted with this, the balance sheet shows $40,000 of stock and bonds, $3,000 of floating debt and the balance comprising substantially the whole of the surplus.

That this company is in great need of new financing is at once apparent, for the following reasons: No provision has been made for retiring the bonds when they mature, by means of a sinking fund; no provision has been made for depreciation and there are no funds on hand to provide the extensions in the coming year, the need of which will be considerable if one may judge from the rate of growth in the past few years. The company would find itself considerably embarassed, for example, in the event of a proposal to consolidate with an adjacent system at this period. The probable course taken as a basis for merging would be to appraise the property, to determine its cost now at present prices for labor, material and equipment, and its present or depreciated value.

As will be shown later, the depreciation on this plant, assuming an average life of about 14 years (7% annual rate), would amount to substantially $30,000, leaving the present value of the property as $40,000. If it were agreed in the terms of the merger that the bonds and notes are to be taken over as liabilities of the new company, there would be an equity for the stockholders of $40,000 less $18,000, or $22,000. Adding to this the unexpended surplus of $3,400, there would be $25,400 to divide among the holders of 250 shares of stock having a par value of $100 each, or at the rate of $101.60 per share, substantially the amount of their investment. Such an outcome of ten years' operation would naturally discourage investment in telephone securities, the net result being no returns whatever on the investment beyond an insignificant 1.6%, although, of course, the principal would be intact.

(To be concluded.)

Telephones in Colombia.

Although the Republic of Colombia, located in the extreme northern part of South America joining with Panama, has a population of 4,000,000 people, its development in telephony is reported to be less than that of an ordinary city of the United States. With the exception of a few of the larger cities and a few mining camps the entire country is said to be without this facility, according to a report by U. S. Consul Charles L. Latham, of Cartagena.

However, the telegraph has been highly developed. The National Government has built and maintains a system and this is used freely.

In Cartagena, a port on the Caribbean sea, having a population of over 10,000, F. & A. Franco, local merchants, built a system in 1899 and this is maintained by them. It is said to be the only public service telephone system in the country. It is known as the Empresa de Telefonas de Cartagena. There are 100 subscribers to the service in this city. For installations made within the walls no charge is made, but subscribers living in any of the suburbs about the city must pay for the wire used to run from the city limits to the house, and for the labor. For ordinary service a charge of $3.00 per month is made, and a service, called long distance service, which, by the way, gives no long distance connections, but simply consists of better appearing equipment with adjustable extension transmitters, a charge of $5 is made. All material, with the exception of a few telephones purchased in Germany, is of American manufacture, and copper wire is used in the lines. Iron wire was found impracticable for use in that climate. A line extending 12 miles to Turbaco had to be abandoned on account of the limited use made of it.

A private system is operated by the Cartagena Railroad Company with 15 telephones, but no switchboard is in use. This connects the offices of the company with its stations, workshops, and wharf. A system in Bogota, the capital of the Republic, connects with Medellin, Bucaramanga, Barranquilla and Santa Marta. Also a few private series of telephones, without central switchboards, are installed in certain of the large mining camps.

Protesting Telephone Subscribers Plan Further Action on Boston Rates.

A subcommittee of citizens of Boston suburbs led by Representative Charles A. Dean of Wakefield, has reported back to the general committee, that the subcommittee is in favor of urging the telephone company to make the new rates of the company in suburban exchanges optional with the subscriber and not compulsory.

The committee also recommended that Boston suburbs be maintained as one zone, as at present, rather than as a large number of zones as proposed and that the charge for telephoning from all Boston exchanges to all of the suburban exchanges with the suburban zone, be five cents instead of ten cents, as it is at present beyond the five-mile limit.

A committee was appointed to take the matter up with the telephone company. This committee will confer immediately with the company and report back to the general committee.

Some More of Price Kiker's Mosquitoes.

The accompanying illustration, from an original drawing by Price Kiker, of Tolar, Texas, has been received by TELEPHONY with the following letter:

"My night operator told me to bring him over some 'mosquito chaser' tonight. The enclosed picture is how he looked to me when I stepped into the office. They are so bad in this part of the country, people have to carry six-shooters and brass knuckles for protection.

Perils of Operating in the Swamp Country.

The man who stands up for his rights with unflinching courage is sure to receive every consideration.

News from Across the Seas

Telephoning Between England and the Continent—Outlook for Extended Facilities and Cheaper Rates—Official Inspection of the Great New Exchange—Telephones of the United Kingdom—Comparative Revenue Returns—Telephony in Japan

By Abercrombie

Despite hopes to the contrary, the British public will find no change whatever in the telephone rates to France for at least twelve months, and in all probability somewhat longer. The approximate completion of the new English cable, which is in its way a great triumph of telephonic art, merely marks the first stage in a change which will take place later on.

The English cable promises to be a great success. The French government is prepared to at once take in hand the question of the second cable. Also it is understood that as the result of the satisfactory performance of the new English cable, a similar type—possibly even an identical cable—will be laid down by France. It might be thought that so soon as the English cable is quite ready for working, a change might be at once inaugurated by the General Post Office in the matter of rates. Inasmuch as this is not the present intention, and in the view of the telephone authorities does not appear practicable, the question of determining the exact amount of reduction is still open.

The official view is in this wise: If a sufficient reduction were made in the telephone rates to Paris, it is expected that a very substantial increase in the number of messages would result. Exactly how far the business might be stimulated and what the number of messages might be under the reduced tariff is a problem which the British postmaster general is unable to solve; but it is considered that it would not be advisable to make any reduction in the tariff until two extra cables were laid and ready for working. It can, therefore, be understood that at present the question of rates is not an urgent one.

An official inspection of the new Glasgow Post Office Telephone Change took place on September 19. An exchange was started by the Glasgow Corporation some years ago, but in September, 1906, that service was acquired by the government. The system then in vogue has since gone out of date and the post office authorities have opened the new exchange, which is installed on the uppermost floor of the Waterloo Street Post Office. At present there are over seven thousand lines in operation and there are ninety operators working on the switchboards in addition to a staff of ten supervisors.

Many important sidelights upon the social, political, and economic developments of the past fifteen years are furnished by the statistical abstract for the United Kingdom from 1895 to 1909, which was published on September 14 as a blue book. The increasing part which the telephone plays is a point which the statistics illustrate. In 1894-5 1,285 people were "on the telephone" in this country, by 1908-9 the total of exchange subscribers had increased to 61,349. The post office took over the trunk telephone system in 1896, and in 1897-8 there were 5,888,247 trunk calls. In the next ten years the total kept on increasing by, on the average, 2,000,000 calls a year, till, in 1908-9, the figure was 23,502,024. The receipts from telephones including royalties were, in 1894-5, £406,005; in 1908-9 they amounted to £7,578,920.

The special Japanese number of the *London Times* which ran to ninety-six pages with no increase on the usual price of six cents made some reference to telephony in Japan. The telephone was first introduced into Japan in 1877—the year following its invention by Mr. Bell—when a trial line was installed between Tokyo and Yokohama and between the various official buildings. After a long controversy, extending over many years, it was decided that the telephone should be under government instead of private control. At first its adoption was slow, so that in 1891 the number of subscribers was only 344, but a progressive policy helped it in public favor. In 1896 the government projected a great extension of telephonic works at an estimated outlay of 12,000,000 Yen to be spread over seven years and this was duly carried out. In 1897 the telephone regulations were revised, and in 1900 rules were organized and a number of telephone booths opened for the use of the public at the same time. In 1905 special telephone rules were issued, according to which telephonic communication could be opened with any place in Japan, provided that the construction and running expense of the lines and apparatus was borne by the applicants. In 1906 new and complete telephone regulations were drawn up and promulgated, and the service settled into a well ordered condition.

The demand for telephonic connections having suddenly advanced after the Russo-Japan war, the government in 1907 proposed to make a second extension of the line during the next six years at an estimated cost of 24,000,000 yen. In this year, too, a special system was organized for the convenience of newspapers. In 1909 another system was established, offering great convenience to those who were in urgent need of telephones.

The number of offices in the telephonic service was 1,354 at the end of 1909, of which 424 were telephone exchange offices and 932 were telephone offices. The number of subscribers was 95,271, and nearly half that number of applications for connection was outstanding.

The telephone revenue and expenditure in the financial year 1908 were 5,262,000 yen and 1,835,000 yen, respectively.

The subscription in Tokyo is £30 per annum and the charge ranges from that figure down to £20 in other areas. As, however, the demand for telephone facilities far exceeds the resources of the department, a telephone broker business has been created, and the privilege of installation has stood at an enormous premium. At one time the market price reached £400, but last year the authorities offered prior rights to applicants willing to pay £100 for immediate facilities, and there was a slump in the market price of transfers. The number of outstanding applications exceed the existing number of subscribers and perhaps the demand for facilities at almost any price may serve to explain the comparative inefficiency of the service, which is by no means up to modern standards. The program announced by the government is to connect another 60,000 subscribers before 1912 at a cost of about £9,000,000. Thirty large cities are now linked up with the trunk system. One Yen is approximately half a dollar.

The Telephone and Domestic Felicity.

According to newspaper reports, a Chicago man has a new scheme for checking trouble in homes before they become too serious.

A. Fierstein, in talking with City officials said:

"I read in a Jewish paper how married folk quarrel all the time, and I think if every house has an arrangement like a telephone so that they can hear at the police station when a husband is going after a butcher knife it will stop all troubles."

He was told to address a letter on the subject to the city electrician.

Telephone Finances

August Report of the Topeka Independent Telephone Company.

Following is a comparative statement of earnings and expenses of the Topeka Independent Telephone Co., Topeka, Kansas, one of the members of the Gary system:

	Six Months Ending Aug. 31, 1909.	Aug. 31, 1910.	Increase.
Gross earnings	$78,271.36	*$89,463.99	$11,192.63
Expense	49,846.11	*57,393.80	7,547.69
Net earnings	$28,425.25	$32,070.19	$ 3,644.94
Interest on bonds	13,802.82	13,824.90	22.08
Balance for dividends or betterments	$14,622.43	$18,245.29	$ 3,622.86
Number of telephones in use and owned by company	5,992	6,958	966
Renewal Reserve			$ 60,516.12
Bonds outstanding		$643,000.00	
Less owned by company		110,000.00	
			533,000.00
Capital stock authorized		$1,000,000.00	
Capital stock issued			400,000.00

(Signed) THEODORE GARY, President.

*Includes tolls.

Increase in Taxes for Ohio Telephone Companies.

Big increases were made in the amounts on which the 600 telephone companies of Ohio will pay taxes this year, by the tax commission of Ohio, which certified the final valuations to the state auditor recently. In most instances the tentative valuations announced some weeks ago were reduced. The commission yielded to the plea of the telephone interests that it was unfair to tax them more than other property which will not pay on this year's higher valuation until next year.

The commission attempted, as near as possible, from information at hand, to put telephone valuation as high but no higher than other property stands on this year's duplicate.

Some deductions also were made because it was found companies in their reports had charged to cost of construction what should have been charged ti cost of maintenance.

The net result was increases all along the lines, as the commission found there had been undervaluation. In a few cases the 1910 valuation is almost 100 per cent higher than that of 1909. The largest actual increase is that of the Central Union Telephone Company, which was boosted from $3,677,876 to $4,903,698. The Columbus Citizens' Telephone Company was raised from $424,947 to $639,000. The Franklin County Telephone Company was raised from $67,600 to $83,900.

The aggregate valuation and increase for the state had not been computed by the commission at this writing, but the figures for the more important companies were announced. Among them were the following:

Company—	1910	1909	Increase.
Cuyahoga Telephone Company	$1,296,161	$ 972,121	$ 324,040
Cincinnati Suburban Bell	2,722,330	2,041,750	680,580
Central Union Telephone Company.	4,903,698	3,677,876	1,225,822
United States Telephone Company.	805,320	504,017	201,303
Toledo Home Telephone Company.	560,530	420,435	140,049
Cleveland Telephone Company	2,027,702	1,520,777	506,825
Akron People's Telephone Company	234,870	121,700	113,170
Youngstown Telephone Company	139,810	87,270	52,540
Ada Telephone Exchange	26,000	24,486	1,514
Ashtabula Telephone Company	67,800	47,250	20,550
Athens Co. Home Telephone Co.	28,000	18,546	9,454
Bellmont Telephone Company	87,000	60,856	26,144
Bucyrus Telephone Company	44,900	26,325	18,575
Cambridge Home Telephone Co.	26,530	19,700	6,830
Central Dis. Printing Telephone Co.	491,556	368,668	122,888
Citizens' of Circleville	48,500	35,470	13,030
Citizens' of Coshocton	25,330	18,660	6,670
Citizens' of Delaware	61,330	31,200	30,130
Clinton Telephone Company	60,100	31,800	28,300
Columbiana Co. Telephone Co.	104,620	78,917	25,703
Columbus Citizens Telephone Co.	639,000	424,947	204,053
Coshocton Co. Telephone Co.	9,320	6,880	2,440
Crestline Local	14,030	9,000	5,030
Elyria Telephone Company	49,700	32,535	17,165
Findlay Home Telephone Co.	42,800	34,120	8,698
Franklin County Telephone Co.	83,900	67,600	16,300
Galion Telephone Company	25,830	13,500	12,330
Greenfield Home Telephone Co.	25,500	23,780	1,720
Greenville Home Telephone Co.	68,030	27,200	40,830
Hamilton Home Telephone Co.	103,000	63,000	40,000
Harrison and Jefferson Tel. Co.	68,600	28,935	39,665
Chillicothe Home Telephone Co.	59,000	40,500	18,500
Dayton Home Telephone Company.	303,000	199,355	103,645
Plain City Telephone Company.	12,080	8,740	3,340
Jackson County Home Tel. Co.	37,000	17,825	19,175
Kenton Telephone Company	46,720	27,832	18,888
Lancaster Telephone Company.	39,670	35,728	3,842
Lima Tel. and Tel. Company	112,000	67,815	44,185
Local Telephone, Bellevue	135,620	54,120	81,500
Logan Home Telephone Company.	22,400	14,080	8,320
London Home Telephone Company	22,230	17,040	5,190
Mansfield Telephone Company	131,200	73,937	57,263
Marietta Telephone Company	32,200	29,290	2,910
Marion County Telephone Company	102,130	65,100	37,030
Massillon Telephone Company	48,230	32,158	16,172
Milersb'g, Wooster & Orrv'e Tel. Co.	138,960	71,420	67,540
Mt. Vernon Telephone Company	96,670	56,050	40,620
National of Ohio	84,850	38,152	46,698
Newark Telephone Company	100,030	60,987	39,043
New Ottawa Telephone Company.	65,240	41,800	23,440
Ohio Tel. & Tel. Company	1,216,400	912,305	304,095
Piqua Home Telephone Company.	40,000	31,000	9,000
Portage County Telephone Co.	65,840	44,064	21,796
Portsmouth Telephone Company	84,800	45,360	39,440
Sidney Telephone Company	44,520	24,310	20,210
Springfield-Xenia Telephone Co.	180,260	128,175	52,085
Star Telephone Company, Ashland.	87,730	46,800	40,930
Stark County Telephone Company.	191,840	136,416	55,424
Tiffin Consolidated Telephone Co.	35,510	20,000	15,510
Tuscarawas Telephone Company.	114,810	60,261	54,549
United Telephone Company	121,280	66,614	54,660
Warren and Niles Telehpone Co.	56,230	33,640	22,590
Zanesville Telephone Company	70,200	54,240	15,960

Elyria Telephone Company Plans to Raise Rates.

The expansion of the service from 848 subscribers in 1902, to 2,089, September 1, 1910, has caused the Elyria Telephone Company, Elyria, Ohio, to seek additional rates to compensate for the increased operating expenses, which is the inevitable result of such expansion.

The company has issued a letter to subscribers telling them that on November 1, rates on business telephones will be raised 50 cents per month, to $3.25, with 25 cents discount for payment monthly in advance. The latter provision is to reduce collection costs.

Southern New England Increases Capital.

Announcement is made in New Haven, Conn., that the Southern New England Telephone Company, a Bell licensee, has authorized an increase in capital of $1,099,100, "to provide for extensions planned and in process."

Waupaca Company Applies to Wisconsin Commission for Rate Advance.

On October 18 a hearing will be granted at Madison, Wisconsin, in the application of the Waupaca Citizens Telephone Company to advance rates according to the following table:

Business, single line from $2 per month to $2.50.

Business, party line from $1.50 per month to $2.00.

Residence, single line $1.50 per month.

Country or farmer lines from $1.25 per month to $1.50.

Abolish ten cent toll charge to all farmer and country lines.

The Commission has an established record of granting increases warranted by the facts.

Rocky Mountain Bell Company Increases Capital.

Amended articles of incorporation show the increase in authorized capital stock of the Rocky Mountain Bell Telephone Company from $2,500,000 to $10,000,000.

The Purcell Rate Case

The Supreme Court of Oklahoma heard last spring an appeal against a decision of the Oklahoma corporation commission, in which it refused to grant L. T. Hine, owner of the Purcell Lexington Telephone Co., permission to increase rates. The refusal to grant an increase seems to have been due largely to a deficient showing of justification by the past record of the system.

Mr. Hine objected to the failure of the commission to make an allowance for depreciation, insurance, etc. It would be unreasonable to deny a company the right to account for these charges against its income on an equitable basis. This failure, however, in the Purcell case, seems to have been due to the absence of any accounting for these items on the books of the applicant.

This case was discussed in TELEPHONY of Nov. 27 last in an article entitled "Expansion Checked by Commission's Ruling," and on the basis of information now at hand it seems evident that some of the criticisms of the decision were unwarranted.

The article referred to stated that the evidence showed the company to have one operator taking care of 300 telephones, to be contemplating the employment of another operator and the installation of a switchboard, and said that the commission's refusal made these improvements impossible. It further stated that the commission had not allowed anything for insurance, either fire or accident, that it had ordered an improved system of bookkeeping and the employment of an expert bookkeeper, and that the corporation commission seemed to have made an effort to check the expansion of the company.

It now appears that the facts concerning the keeping of the books of the company appeared to the commission to justify changes in that department rather than in the rates. It was shown that the applicant was operating six exchanges and that salaries of officers for supervision and management, for a treasurer and for a bookkeeper, all handling the entire six exchanges, were charged against the Purcell exchange alone; but that notwithstanding this disadvantage the Purcell exchange purported to be paying ten per cent on the investment represented, and had a liberal surplus for contingencies. The order did not refer to the employment of an expert bookkeeper, but pointed out clearly the need for proper and systematic bookkeeping and *stated specifically that if under a proper conduct of accounts the applicant could show failure to earn a fair and equitable margin of profit on operations he could apply for further consideration.*

As the company's books showed no expense for insurance, either fire or accident, the commission allowed for no charges against this account.

TELEPHONY has learned that the commission thinks that its order not only safeguarded the public, but worked a benefit to the company, and that TELEPHONY'S observation that it sought to check expansion by the applicant was unwarranted.

The decision in this case is as follows:

On the 10th day of November, 1908, the Purcell-Lexington Telephone Company of Purcell, Oklahoma, filed application with the Corporation Commission, asking that it be allowed to raise the rates in the city of Purcell for telephone service as follows: Business telephones from $2.00 per month to $2.50 per month; residence telephones from $1.00 to $1.50 per month.

Evidence was heard March 11, 1909. Case was continued until April 16, 1909, when additional evidence was taken.

The applicant testified that he owns and operates a telephone exchange at Purcell, Oklahoma, also exchanges at Lexington, Lindsay, Wayne, Wanette, and Maysville; that he operates toll lines between all exchanges, and does a general telephone business; that the approximate value of the system is $40,000.

The applicant further testified that the service up to and including the time of the hearing was not and is not now up to the standard owing to the congested condition of his switchboard; that he has had difficulty in securing good operators, but at the present time the operators are proficient.

In opposition to the granting of the petition, testimony was introduced to the effect that the present rates are too high for the character of service rendered; that the service is deficient and frequent complaints are heard in relation to same. The deficient service was said to consist of the incompetency and inattention of the operators caused by one operator being compelled to look after three hundred telephones. The subscribers of the Purcell-Lexington Telephone System are entitled to good commercial service and sufficient operators must be employed to give such service.

Evidence was introduced (report of the Engineer of the Commission) showing the replacement cost of the Purcell and Lexington exchanges, which the applicant upon advice of counsel did not object to, and was admitted as *prima facie* correct—as the value of the plants.

(Exhibit B.) Classified summary showing the replacement cost of the physical properties of the Purcell and Lexington exchanges as of date December 5th, 1908:

Classification.	Purcell.	Lexington.
Pole Line	$5,099.00	$1,816.00
Telephone and Appliances	3,480.00	1,324.00
Proportion of River Construction	578.00	222.00
Interior Equipment	1,151.00	587.00
Interest 5% During Construction	258.00	99.00
Furniture and Fixtures	72.00	32.00
Stock on Hand	968.00	
Tools	249.00	
Total	$11,855.00	$4,080.00
Total of Both Plants		$15,935.00

It was not sufficient for the Commission to know alone the value of the property to pass upon the application; it is also necessary to know the earning capacity and the expenditures incurred in securing such earnings. The auditor of the Commission was sent to examine the books of the company, and reports that the books showing the receipts and disbursements of the company were almost inextricably mixed and confused. However, with the assistance of Mrs. Hines, the treasurer, and a recently employed bookkeeper, the auditor was able to formulate a financial statement, which is as nearly correct as it is possible to make it until the new system and classification of accounts as prescribed by the Commission becomes effective.

(Exhibit C.) For the month ending December 31, 1908, the total receipts were $730.70, and the total disbursements $612.10, leaving a profit of $118.60.

(Exhibit D.) For the month ending January 31, 1909, the total receipts were $889.08, and the disbursements $605.96, leaving a profit of $283.12. (Note uncollected subscribers' rentals and tolls are not included in this exhibit.) The average profit per month as taken from the above statements is $200.86, which average will bring an annual profit of $2,410.32 for the Purcell exchange. This will pay a ten per cent dividend on the investment, amounting to $1,185.50, and leave a liberal surplus, amounting to $1,224.82 for contingencies.

Evidence was introduced (Exhibit A), income account for the Purcell exchange only, as a copy of the company's books for the month of January, 1909, as follows:

January, 1909.			
Rim. to Pioneer for tolls.	$145.05	Telephone Rentals	$400.90
" " Chickasaw "	16.90	Tolls	204.50
Messenger fee to Pioneer	2.25	Col. of Old Balance	122.05

Uncol. Telephone Rentals	108.30	Com. of Chickasaw	8.67
" Tolls	26.95	" " Pioneer	43.21
Rent for Office	10.00	Messenger Fee	.75
Pencils and Stamps	2.20	Cash at Pay Sta. 1	18.95
Carl Seastrand	60.00	" " " " 15	7.25
Dovie Bartlett	39.00	" " Office	82.00
Beatrice Stealey	27.50		
Alice Thompson	22.50		
Nettie Kynaid	22.50		
Work of L. T. Hines	80.00		
" " Will Neil	24.00		
" " John Neil	30.00		
" " W. Cooley	18.00		
Interest	25.16		
Taxes	9.90		
Treasurer	80.00		
Profit	147.87		
Total	$889.08	Total	$889.08

As is shown by the above statement, the salaries paid the bookkeeper and treasurer are charged in full to the Purcell exchange. It is the opinion of the Commission that the salaries of these officers should be apportioned among the six exchanges connected with the system, and that the charge as made to Purcell is an unfair charge. Further, it is the opinion of the Commission that the salary of the manager, and wages of the linemen as apportioned to the Purcell exchange, are unfair; that they should be apportioned among the six exchanges connected with the system; same as the salary of the bookkeeper and treasurer. The apportionment of salaries should be made on the ratio that the total number of stations operated in Purcell bears to the grand total of stations operated at all exchanges.

It is the opinion of the Commission that while a correctly kept system of accounts may show somewhat different results, the results above indicated are the best which can be arrived at at the present time. The results indicated point out clearly how unwarranted the application is, as the books show a safe and equitable margin of profit. But it may be added that whatever modifications in the present findings may result from systematic methods of bookkeeping and operating, might, when the circumstances have changed so that the actual expenditures will show that the rates now is force do not yield a reasonable compensation for the services rendered, the applicant may apply to this Commission for further consideration in his behalf. In that event, if the Commission finds that the condition of the business is such as to admit of the application, the commission will then make whatever order is necessary to remove any obstruction placed by the evidence in this case.

It is. therefore, ordered that the same rates for business and residence telephone service as are now in force in the town of Purcell, namely, $2.00 per month for business telephones, and $1.00 per month for residence telephones, shall be and remain the same unless otherwise ordered by the Commission.

Therefore the application to increase the rates be, and is, hereby denied. CORPORATION COMMISSION.

(Signed) J. E. Love, Chairman; J. J. McAlester, Commissioner.

Sept. 29, 1910.

The supreme court, however, seems to have been dissatisfied with the manner of presentation of the case for its judgment in much the same way that the Corporation Commission was. The court quotes from the decision of the Railroad Commission of Wisconsin in the Madison rate case, and says:

"In the case at bar, there is neither any evidence nor finding of fact in the record as to the value of the property employed by complainant in its exchange at Purcell, the gross earnings under the pre-existing rates, and what constitutes a reasonable amount for operating expenses, including the reasonable depreciation of the physical property and adequate returns on the investment. This is necessary. Nor has any brief been filed in this court, either on the part of the complainant or the state (appellee). If the complainant or counsel for the state have recognized, as they should, that it was necessary for evidence to be heard upon all these issues, and a finding thereon made, in order to sustain the rates promulgated, and for that reason have not filed a brief, they should have expedited the business of this court and facilitated the final determination of this proceeding by suggesting the deficiency of the record and its being remanded for the hearing of additional evidence and additional findings.

"We have carefully examined this record, and reached the conclusion that this cause should be remanded to the commission with instructions to proceed to make such investigation of the evidence introduced at the former hearing and all other evidence that may hereafter be offered by any party in interest, as is necessary to make a finding of facts, and, when this is done, to make such finding and to certify the same, together with the evidence, to this court within 90 days, for its further consideration. All the Justices concur."

The presentation of evidence in telephone rate proceedings before commissions and courts is an art still in the process of development. TELEPHONY is glad to give space to this extended discussion of the Oklahoma case, not only because its previous reference to it seems to have been inadequate, and partially erroneous, but because it believes that a study of the deficiencies in the method of presentation may assist telephone companies and commissions in arriving at harmonious and equitable relations in future cases which may arise.

The Private Branch Exchange in the South.

Within the past few years the development of industrial and commercial enterprises in the south has been so rapid that a marked change has come in the workings of southern telephone companies. The change has been chiefly along the lines of developing and extending the usage of the private branch exchange, which is regarded as nothing short of a blessing by hundreds of big mercantile and manufacturing corporations in the southland today. Department stores, factories, office buildings and dozens of other business establishments have introduced the P. B. X., and its growing popularity attests the extreme adaptability and economy of the service, and that these points are becoming recognized.

Enterprising contract agents of telephone companies in Dixie make it a special point to watch the development of every manufacturing or mercantile concern in their particular towns, beginning from the time that a new corporation enters upon the field. As soon as the business grows sufficiently to demand a large amount of calls daily, the proprietor of the establishment receives a call from a representative of the telephone company's contract department. The telephone representative unobtrusivly 'gets a line on' the prosperity or lack of it of Mr. Business Man, He estimates the size of his business, from outward appearances, and calculates the number of departments in the establishment, together with the floor space and distance between the departments. After a general prospect of the factory or store, the telephone agent is prepared to talk business to the manager of the establishment.

Acting on the principle that a dissatisfied customer is worse than no customer at all, the telephone man never attempts to force a branch exchange on the subscriber unless the needs of the latter's business justify more complete telephone service. If the merchant does not take kindly to the P. B. X, idea, he has the general plan and workings of an intercommunicating system, with its advantages, outlined to him. The difference between the intercommunicating line and the private branch is explained fully by the telephone representative, and although the cost for each of the systems depends upon the number of stations and their distance apart, the business man receives a practical demonstration of the difference in cost between an I. S. and a P. B. X., with each station costing $1 monthly.

From the telephone expert's point of view, the branch

exchange or intercommunicating system is a success if a standard rate is fixed for each station, and the cost of each exchange is simply regulated by the number of stations in connection. Southern telephone companies make it a point to determine the cost of the exchange, not only according to the number of stations, but also according to the distances separating the various points. Where a warehouse is perhaps five or six hundred yards from the main office of a factory, there will be additional cost for wiring to the telephone man, and in addition there will be a proportionately large amount of time saved for the subscriber who has the branch installed in the warehouse. These two factors figure in the increased cost per month for branch exchange service.

The fact that the telephone company regulates the cost of a private system according to the territory it covers makes the latter sort of service rather expensive, but the telephone representative counts upon never installing a branch exchange or intercommunicating system where the volume of the merchant's business, or the time saved by the use of a private system, would not justify its operation.

Subscribers who maintain private branch exchanges in the region south of the Mason and Dixon line find but little trouble in obtaining good operators for their private lines. The usual wage paid to a girl who operates a branch exclusively is about $30 per month. A number of corporations combine the work of telephone operator with some light office work, coming under the daily routine of business, and the operator's wage is correspondingly boosted as her duties multiply.

Service Value.

By H. P. Fairman.

The telephone has become so important a feature of commercial life that it is high time that subscribers be brought to realize its value. A little missionary work among the large users of service will produce unexpected results.

It has been a custom of too long standing, that when a subscriber is approached by a representative of a telephone company, he assumes a combative attitude; puts on his war paint so to speak. A few pointed questions may convince him that he knows very little of the real value of the service. If asked what percentage of his business is handled direct by telephone he has not the slightest idea. To an inquiry as to how many of his patrons enter through the "Telephone Gate" he can only respond that he does not know. Questions as to how and by whom these communications are received develops the fact that the matter has been given very slight, if any consideration.

"That's our business," he will say. "You get the calls to us and we will take care of them."

But he does realize that the calls are not being properly called for. He must be shown that patrons are too often subjected to flippant, discourteous treatment and unnecessary delays which faults are beyond the control of the telephone companies. He may be paying for trunk line service for the mere accommodation and personal convenience of certain employees.

The following quotations from a nicely printed pamphlet concerning its telephone service issued by a large corporation are almost self explanatory. The very first page shows the removal of the combative spirit which was maintained for years.

"We desire to acknowledge with sincere thanks our indebtedness to the officials of the ———— telephone company for the benefit of their suggestions and advice in the preparation of this pamphlet." On the following page it says in part:

"Our telephone service must not only be good; it must be above criticism. The accomplishment of this result rests with *you*, and your individual application of the suggestions contained herein will be carefully observed."

After outlining certain conditions peculiar to their business routine the attention of the employes is called to other things of general application, among them "Courtesy." "True courtesy *pays*:

—Because it makes friends for the company as well as the employee. Its practice is conducive to greater dignity and self respect. It eliminates friction, and lubricates the machinery of business."

This pamphlet is a result of patient missionary work on the part of tactful telephone employees engaged in handling service complaints.

Another corporation was convinced that to secure the maximum amount of service for a minimum cost it was worth while to employ a man familiar with telephone service to attend to that branch of its business. The head of this corporation states his position as follows:

"The additional expense will not increase our cost of production one-twentieth of one percent, while the loss through regular and prospective customers being unable to transact business over the telephone cannot be over-estimated. I want our customers to give us a preference because of receiving prompt and courteous treatment by us. I want them to realize that it is a waste of time to come here in person, except on matters of the greatest importance."

With this concern it is not an uncommon occurrence for the president himself to be called from his bed or from his Sunday dinner to receive a two-dollar order. In this case the telephone company's responsibility is relieved by carrying the calls to some designated terminal and this is as it should be.

The officials, and not the minor employees, are relied upon to care for the business during emergency hours and their whereabouts is always known to the attendant on duty in the office. This is the result of further tactful missionary work which resulted in their being convinced that the employees of the telephone company could not be instructed in the exigencies of the business sufficiently to question callers intelligently.

Technical Description!

Following is an example of English as she is applied to the telephone business—by a reporter for the Sterling, Ill., Gazette.

HEAVY PHONE CABLE BROKE.

Strain Too Much for Supporting Wires on Cable in Rock Falls in Alley Back of Bank.

This morning about 6:30 o'clock the wires which supported the heavy cable of the Bell telephone company in the alley in the rear of Rock Falls bank snapped and the great cable fell several feet until it was caught by projecting foot arms sticking out on some of the other tall poles along the line. In some places the great cable sunk down many feet, the gap in the broken wires fell away from each other to a distance of nearly fifteen feet. Had the cable not caught on these little iron arms, the cable would have broken and might have killed many passers by walking for the severance of the two hundred and forty pairs of little wires means a great of expense, besides time in getting a new cable in place. The wires holding the cable up are eight good sized common wires twisted together. When the break occurred there was a general disturbance on many of the telephones on that line as well as those which were effected in the sudden jerking. It is being repaired today.

Our forefathers had no telephones—neither did the ladies. Methods have changed and we have outlived the customs of an age that only crept, and moved not on wings of pulsating time.

Our demands are measured to a great extent by our desires. The public demand good service, and the telephone men desire that they get it—sometimes.

More Man-Power Through Competition

By Permission of System, the Magazine of Business.

By Walter Dill Scott

Director of the Psychological Laboratory of Northwestern University.

Thirty years ago American steel makers were astonishing the world with new production records. What English iron-masters, intrenched in their supremacy for centuries, had regarded as a standard week's output for Bessemer converters, their young rivals in mills about the great lakes were doubling, trebling and even further increasing. Hardly a month passed without a new high mark and a shift in possession of the leadership.

To this remarkable increase in efficiency William R. Jones—"Captain Bill" Jones as he was familiarly known—contributed more than any other operating man. He was a genius among executives, as well as an inventor of resource and initiative—a natural leader and handler of men. When he was asked by the British Iron and Steel Institute in 1881 to explain the reasons for the amazing development in the United States, he attributed it to the organization spirit of the workmen and the rivalry among the various mills.

"So long as the record made by a mill stands first," he wrote, "its workmen are content to labor at a moderate rate. But let it be known that some other establishment has beaten that record and there is no content until the rival's record is eclipsed."

On the intensive development of the idea by Andrew Carnegie, within his expanding organization, hinged the tremendous progress and profits of the Carnegie Company. "The little boss" matched furnace against furnace, mill against mill, superintendent against superintendent. He scanned his weekly and monthly reports not merely for records of output, but for comparative consumption of ore, fuel and other supplies, for time and labor costs in proportion to product.

If a superintendent, foreman or gang failed to respond to this urging, failed to get into the race for the famous broom which crowned the stack of the champion Carnegie mill or furnace, the parallel showing of the other mills became a club to drive the laggards into line. So intense was the competition, so sharp the verbal goods applied that Jones, after indignantly resigning, parodied the Carnegie fashion of bringing executives to book in sarcastic notes in this manner: "Puppy dog number three, you have been beaten by puppy dog number two on fuel. Puppy dog number two, you are higher on labor than puppy dog number one."

How effective was this system of pitting man against man, plant against plant, was shown by the dominant position of the Carnegie Company in the trade when the Steel Corporation was launched and by the staggering value put upon its business.

In the handling of executives it was carried to such extremes as few great managers would approve today. Undeniably, however, the contest idea was an important influence in the building up of a vast business in relatively brief time, while the influence on the pace of the whole industry gave the United States its present supremacy in steel and iron. It survives in the parallel comparisons of records with which the Steel Corporation measures the efficiency of its units of production and keeps its mill superintendents to the mark. It is utilized, in some degree and in varying departments, by hundreds of successful houses.

Let us analyze the facts, the habits of thought, the emotions behind it and determine where and how it may be applied to the task of increasing our own and our employes' efficiency.

The experienced horseman knows that a horse is unable to attain his greatest speed apart from a pace-maker. The horse needs the stimulus of an equal to get under way quickly, to strike his fastest gait and to keep it up. In this particular an athlete in sprinting is like the horse. He is unable by sheer force of will to run a hundred yards in ten seconds. To achieve it he needs a competitor who will push him to his utmost effort.

The struggle for existence, one of the main factors in the evolution of man, has raged most fiercely among equals; without it, development scarcely would have been possible.

So fundamental has been this struggle that the necessity for it has become firmly established within us. We require it to stimulate us to attain our highest ends.

As is made evident by a consideration of imitation we are eminently social creatures. We imitate the acts of those about us. Imitation is, however, only the first stage of our social relationship. We first imitate and then compete. I purchase an automobile in imitation of the acts of my friends but I compete with them by securing a more powerful or swifter car. Erecting a new building because some other banker has done so, the second individual does more than imitate. He competes with the first by planning to erect a more magnificent structure and on a more commanding site. Or a great retail store, announcing a "February sale" of "white goods" or furniture, invariably tries to surpass the bargains offered by rival establishments.

We do indeed imitate and compete with all our associates but those whom we recognize as our peers are the ones who stimulate us more to the instinctive acts of imitation and competition.

Our actual equals stimulate us less than those whom we recognize as the peers of our ideal selves—of ourselves as we strive and intend to become. The man on the ladder just above me stirs me irresistibly.

The effect of one individual upon others then is not confined to imitation. There is a constant tendency to vary from and to excel the model. My devotion to golf is mainly due to the example of some of my friends. My ambition is to out-play these same friends. Imitation and competition, apparently antagonistic, are in reality the two expressions for our social relationships. We first imitate and then attempt to differentiate ourselves from our companions.

The manufacturer or merchant imitates his competitor but tries also to surpass him. Indeed it is a truism that competition is the life of trade. In the shop and in the office, on the road and behind the counter, in all buying and selling, competition is essential to the greatest success. Competition, the desire to excel, is universal and instinctive. It gives a zest to our work that would otherwise be lacking. In every sphere of human activity competition seems essential for securing the best results.

We assume ordinarily that competition exists only between individuals. As a matter of fact, a slight degree of competition may be aroused between a man's present efforts and his previous records.

While not so tense or so compelling as is competition between individuals, it has the advantage of avoiding the creation of jealousies. In all the more exciting and stimulating games, rivalry between individuals is a prominent feature. In golf the game is frequently played without this factor, the only

competition being with previous records or with the mythical Bogy.

Such competition adds considerable zest to the game, and the same principle is applicable to business. The most compelling rivalry is between peers; lacking this, however, it is possible to pit the possibilities of the present month against the achievements of the previous four weeks or the past year or even against a hypothetical individual "bogy." This bogy may be fixed by the executive and the man induced to compete with it. Thus the dangers of competition may be minimized and the advantages of the human instinctive desire for competition be gained.

In the average well-organized business the carrying out of such a plan would not be difficult. Studying the previous records of his men, a manager or foreman could determine what each individual bogy shall be. The employe should know just what the *record is* that he is competing with, and that his success or failure would be recorded to his credit or otherwise. Above all, the bogy must be fair and within the power of the man to accomplish.

Competition need not be confined to individuals. Frequently one city finds a stimulus in competing with another. Nations compete with one another. In any organization one section may compete with another.

In an army there may be competition between regiments. Within the regiment there may be the keenest rivalry between the different companies. We are such social creatures that we easily identify ourselves with our block, our street, our town, our social set, our party, our firm or our department in the firm. These groups may be rendered self-conscious and thus made units for competition, like teams in any game of sport.

It is possible to create such units for competition in business organizations. In some instances individual employes of one firm are pitted against those of a competing firm, the contest proving stimulating to the men in both. In other instances the competition is restricted to the house, and similar departments or sections are the units.

The closer the parallel between the units and their activities, as in the Carnegie blast furnaces and steel mills, the more interesting and effective the competition becomes.

Many important houses use competition as part of their regular equipment for handling and energizing men.

Particularly is this true of manufacturers and distributors of specialties, patented machines, trade marked goods and lines, and wholesalers whose travelers are selling in territories where conditions are generally the same. Several firms of this sort make conscious and elaborate use of the instinct of competition in their ordinary scheme of management.

A concrete and typical illustration of its application to selling is afforded by the experience and the undoubted success of one of the largest specialty houses which distributes its products direct to the consumer. The sales force numbers about 500 men and executives of wide experience declare that the organization is, of its size, the most efficient in the United States. Analysis of this company's methods is most illuminating and suggestive because every phase of the instinct of competition has been exploited to the advantage of both the house and its employes.

The medium of competition is a series of competitions—monthly, quarterly, even yearly—which bring into play all the motives urging individuals towards maximum effort and industry—desire to beat bogy, ambition to win in individual contests with immediate neighbors and against the whole organization, team spirit in the matching of one group of agencies against another group and finally organization spirit in the battle of the whole force to equal or surpass the mark which has been set for it.

HIAWATHA ON TELEPHONY.

By William F. Kirk.

"Have a seat," said Hiawatha,
"Have a seat and let me tell you
How the 'phone was first invented
In the land of the Dacotahs—
In the land of dashing damsels.
You who think it is a fixture
Alexander Bell discovered,
Harken to my thrilling story
How the telephone was founded
By the bold, progressive Injuns.

"In the land of the Dacotahs
Dwelt a very cunning sachem,
Known as Big Chief Busy-Thinker,
Very keen was Busy-Thinker,
Very smooth and self-reliant.
He had planned a kind of warpaint
That was proof against the scrubbing
Of the strongest brave who used it;
This, of course, eliminated
All the fuss and all the bother
Of repeated applications.

He had made a bow and arrow
Which would aim itself so surely
That the arrow never faltered,
Never failed to pierce the gizzard
Of the object it was aimed at.
Furthermore he had discovered
An effective application
For the absolute removal
Of the deadly little blackhead,
Thus receiving the approval
Of the fair Dacotah Ladies.

But the thing that capped the climax
In the life of Busy-Thinker
Was the telephone he fashioned
After many years of labor.
Out of slender strips of rawhide
Busy-Thinker made the wires,
Made the diaphragm of deer-bone
Scraped about as thin as daylight;
Out of flint the insulators
Were by Busy-Thinker fashioned.

"When the system was perfected
Busy-Thinker gave a party
To his wondering subscribers,
Showed them how to call up Central
Who was quite a clever maiden
By the name of Line-Is-Busy;
Showed them how to get the numbers
How to ring it off, etc.

"Great the joy and exultation
In the land of the Dacotahs
When the patrons saw how easy
Life was made by the invention
Of the wise old Busy-Thinker.
Mrs. Heavy-on-the-Talcum,
Social leader of the outfit
From the doorway of her wigwam
Could send out her invitations
O'er the phone to all the smart set.

And the ancient arrow maker
Took more orders in the morning
With the telephone's assistance
Than he used to take while hiking
All about that sandy country
From the early dawn till evening.

Even I, my little dearies,
Used the 'phone to land my sweetheart;
Old Hank Longfellow has told you
How I won my Laughing Water,
But his story's not authentic:
I just called up Minnehaha
O'er the phone and popped the question,
And the little dear accepted
With such eagerness and vigor
That the old transmitter rattled.

"This, my children, is the story,
Of the way the 'phone was founded
By the wise old Busy-Thinker
In the land of the Dacotahs.

Moral.

How can you, enlightened people,
Dwelling in this modern village
Do without the great appliance
That was reckoned so essential
By the sleepy old Dacotahs?

—*Wisconsin Telephone News.*

The Electromagnet Receiver

By W. J. St. Onge,

Advertising Manager, the Dean Electric Co.

The "direct current," or rather the electromagnet type of receiver, is as old as the art of telephony itself. It was discarded for a supposedly better style of instrument—the well-known permanent magnet type—because the latter seemed to be more efficient and much better adapted to the needs of the business. Like many other electrical and mechanical devices, it was cast aside, without being given a fair trial, for a substitute which apparently was its superior from every point of view.

This conclusion was reached at a stage in telephonic development when magneto, local battery telephones represented the highest type of instrument to be had. Since that time, however, the development of the common battery system was brought about, bringing with it sweeping and radical changes in all directions, especially in densely populated cities and towns. During all of this change in arrangement of apparatus and operating methods, nearly every element received attention which usually resulted in an improvement of some kind.

However, the telephone receiver during all of this period retained its old-time design with little appreciable change. This would naturally indicate that telephone men considered that the receiver, as it then stood, represented a satisfactory type of equipment of its kind, and that no improvement was either necessary or probable.

Some time ago one Independent manufacturer developed an electromagnet type of receiver which is a marvel of efficiency, and since that time several other makers have taken up the subject with success. The electromagnet receiver is a complete refutation of all claims that such an instrument is not a practical proposition. The development of this piece of apparatus has shown that the principle of the electromagnet receiver is sound enough, provided it is applied in an intelligent manner.

In any receiver, no matter of what type it may be, the question of the magnetic circuit is of first importance. If this one feature is poorly taken care of, the resulting instrument will be of inferior quality, regardless of any care exercised in building the remaining parts and assembling them.

The distinctive feature of the electromagnet receiver discussed in this article is that of the laminated pole pieces. The object of this is, obviously, to eliminate all losses due to poor annealing and eddy currents. Such a construction as this renders the receiver more responsive and prevents the dissipation of electrical energy in the magnetic circuit, and naturally insures that every hundred-thousandth part of an ampere flowing will be utilized to a high degree in the transformation of the energy represented in the current variations into vibrations of the diaphragm. Each of these laminations is punched out separately in an E-shaped form, as illustrated in Fig. 1, then carefully annealed, and each one treated to a coating of insulating varnish before assembling.

The complete receiver core is formed by fastening a sufficient number (about 20) of these E-shaped laminations together, using two brass bolts for the purpose. The assembled core resembles a block E, the three legs being all of the same length and 1-4-inch square on the pole ends, as shown at the left of Fig. 2. It is obvious that by using such construction methods all joints in the magnetic circuit are eliminated. No chance is left for the introduction of an unintended air gap at the point between the base of the core and the pole piece. The method of construction in this instrument entirely removes even the possibility of a fault.

Another very important point arises in this connection. In the usual type of pole piece receiver core the question of annealing the metal is usually problematical. The degree of hardness in all portions of the piece may not and usually is not the same. Consequently, some portions are more susceptible to magnetic action than others, thereby producing an unbalanced effect not in harmony with the efficient working of the instrument. The laminating of the pole pieces insures uniformity of annealing in all of the component parts. There is no question concerning this point, when the possibilities of perfectly annealing a thin piece of metal are taken into consideration.

In designing repeating coils, a solid core would not be used in any case. Experience has shown that in order to have coils of sufficient efficiency as to be at all commercial an extremely responsive magnetic core is necessary. As a result the efficient repeating coil of today has for its core a properly arranged bundle of soft, annealed iron wires of considerable cross section. The same line of reasoning applies to the proper design and construction of the receiver.

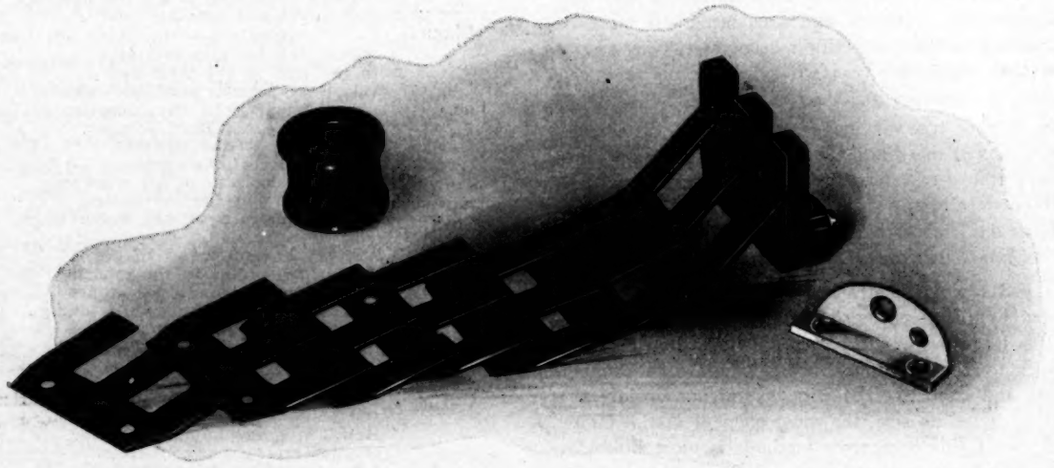


Fig. 1. The Many E- Shaped Laminations Used in an Electromagnet Type Receiver. Clamps for Holding Laminations Together, as Well as the Winding, are Shown.

The energizing coil spool mounts on the middle leg of the E-shaped laminated core. This spool itself is made of the highest quality of a special insulating material called "Hornite," and serves as a thorough insulation of the winding from the core. The winding consists of a high-grade silk insulated cop-

per wire. After it is wound upon the fibre spool, the whole is baked and treated with dynamo armature varnish, which completely permeates both winding and spool. It is then submitted to a thorough baking process which renders the electrical circuit waterproof and able to withstand extreme climatic conditions without any loss of electrical efficiency. This in itself is a big step in advanced electrical design over the ordinary receiver construction, as it assures permanency and high sustained insulation.

After the completed coil is put into place upon the middle leg of the core, the whole is mounted in a cup-shaped frame of the instrument, by means of two screws. Fastened to the outside of the cup is a block upon which are mounted the spring connecting clips for the receiver cord terminals. Extensions of these spring clips pass through the cup-shaped frame and are soldered directly to the ends of the coil winding, thereby insuring permanent electrical connection and removing any possibility of crosses with the receiver shell, if the latter is of metal.

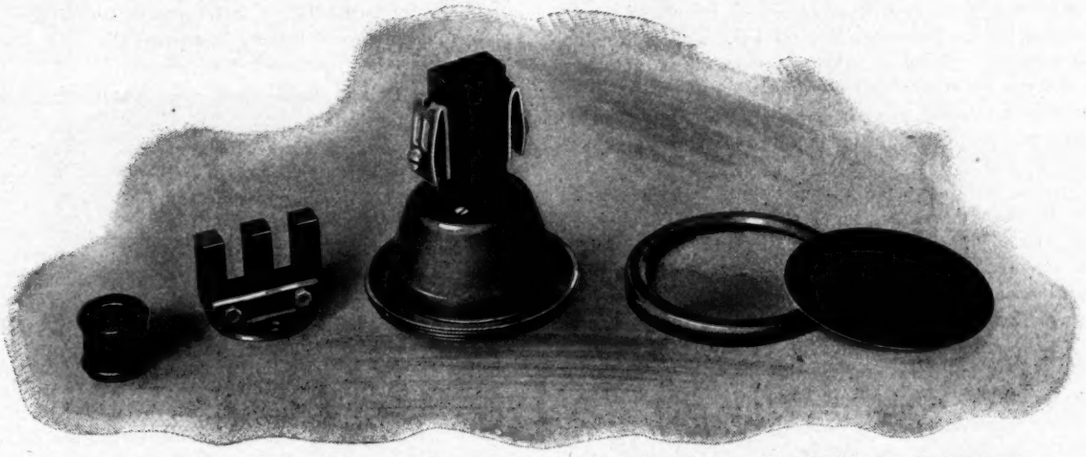


Fig. 2. Electromagnet Type Receiver, Showing E-Shaped Laminated Core Assembled; also Containing Cup, Diaphragm and Clamping Ring.

The spring connecting clips are of a special style, designed especially for use with the pin style of cord tip, but will also accommodate a loop-end connection. The construction is such that, when the cord tip end is placed in its slot in the clip, and the retaining screw tightened up, the natural spring tension of the clip itself prevents any loosening of the retaining screw. Thus a very secure connection is maintained at all times, which will not jar loose, bend, or otherwise injure the cord tip end in any way. It engages the tip throughout its entire length and any vibration to which it is subjected makes it grip still more tightly.

Another interesting point concerning this receiver is the manner in which the diaphragm is held in place. Dependence is not made upon the cap of the shell to perform this function. The diaphragm of this direct current receiver is fastened to the cup-shaped frame by a metal retaining ring. Hence no dependence is placed upon the outer shell whatever. This obviates risk of troubles due to change of the air-gap separation between the core ends and the diaphragm, which might be present were the outer shell a part of the operating element of the instrument, swelling or shrinking by the action of heat and cold.

It was the direct current receiver that made the so-called direct current common battery telephone circuit possible. In the latter, the talking circuit consists only of a transmitter, a one-contact hook-switch, and an electromagnet receiver, all in series. Heretofore such a circuit has been impossible, on account of the destructive effect of the direct current from the central office battery through the winding of the permanent magnet receiver, a demagnetizing or change of air-gap being the usual result.

The ringing apparatus consists of a ringer and a simple condenser permanently bridged across the line binding posts of the telephone. None of the ringing circuit appears in the talking circuit. Consequently, the condenser and ringer may be of a design best suited to signaling purposes only, whether individual line or harmonic ringers are used.

This fully laminated electromagnet type of receiver proves its worth on long lines. An electromagnet type of receiver will not work on a long line to advantage unless the degree of magnetization of the core is quite large. If this is the case, it is natural to suppose that the result will be a highly supersaturated core on a short line, which is a detriment to good receiving quality. The design of the particular laminated core shown in this article is claimed to be the happy medium, picked from actual service from receiver models using cores varying from 1-16 of an inch square to about 1-2 inch square.

Many long distance telephone companies employ a "Booster Battery" in connection with the toll switchboard, to facilitate the transmission. Ordinarily this action assists the transmitter only. Using this electromagnet type receiver in such an instance as this means that the receiver as well as the transmitter will be benefited by the action of the "Booster."

Although this laminated core electromagnet receiver is but a recent development the manufacturer states that nearly a hundred thousand of them are already in successful use.

The possibilities of operating long common battery lines successfully have been materially increased since the introduction of this laminated electromagnet receiver to the telephone world. It is obvious that, with a proper design, it will operate efficiently on the longest line over which central battery current can be fed to a common battery transmitter for commercial transmission. In fact the most surprising results have been obtained on long common battery lines—lines where the ordinary common battery telephone instrument is claimed to fail to respond.

Labor-Saving Auger for Telephone Men.

In boring holes for telephone poles there are sometimes encountered obstacles and difficulties that increase the cost, labor and time. The operation can be reduced to a minimum, provided the matter is given intelligent thought. While different sections vary in the character of earth, and the ground in some localities is compact and stiff, other sections show quite opposite characteristics.

To overcome these objections satisfactorily, there should be employed in the operation of boring the holes such a device as will eliminate the hardship and expense of unusual labor. To meet the exacting requirements of this matter in connection with telephone construction work, the Standard Earth Auger Company, of Chicago, has placed on the market a special auger with a patent telescope stem. This maintains the auger handle at a convenient height in boring the holes.

Products of the Factory

Stromberg-Carlson Company Prominent at Interurban Railway Association Convention.

Since the recent street railway disasters in the middle west business has been booming in equipment for dispatchers' signals and telephone systems for interurban railways. It is recognized that these systems pay for themselves over and over not only in facilitating the handling of congested traffic at the time of state fairs and other causes of a rush of travel, but in imposing the greatest possible restrictions upon thoughtlessness of carmen, making it next to impossible to get by a a turnout without an order from the dispatcher.

The Stromberg-Carlson system has been highly developed and has been put into operation on many of the leading roads in the country.

At the Atlantic City convention of the American Street and Interurban Railway Manufacutrers' Association, October 10 and 11, the Stromberg-Carlson company featured its dispatchers' signal systems and telephone for out-door and in-door stations, as well as intercommunicating telephones, private branch exchange switchboards and railway auxiliary equipment.

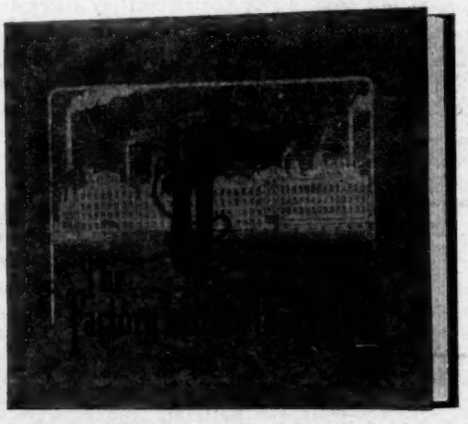
Visitors to the convention were kept constantly in mind of the Stromberg-Carlson boys by a number of very ingenious advertising stunts. Convention mailing cards, a new idea of the advertising department, were sent to all the visitors who were suspected of being in the market, and no one got away without knowing that Stromberg-Carlson was not only there but had the goods.

Among the representatives were H. C. Slemin, sales and arvertising manager, H. L. Lucia, C. P. Button ,J. O. Oliver, and E. P. Ellis.

Kellogg Factory Brought to the Purchaser.

The making and assembling of various telephone parts, in a large factory, is a process of no little interest to those engaged in telephone work. With the double purpose of printing an interesting little booklet and to give evidence of the absolute honesty in construction, which characterizes its equipment, the Kellogg Switchboard & Supply Co. has issued a small illustrated booklet, "The Factory Behind the 'Phone."

Photographic views of the more important departments are given. The lumber yards and kiln, where first grade telephone box and switchboard cabinet material is handled;



the varnishing departments, where the cabinets are polished and finished in a thorough manner; illustrations of the Kellogg cable and cord braiding machines, products of which have gained a world-wide reputation; the winding room, well lighted and commodious, for the comfort of the workers, ensuring a uniform product—these pictures show that the general machine and apparatus equipment of the Kellogg factory is the best obtainable. Of special interest are the plating and condenser departments, because telephone men know from experience the wearing qualities of Kellogg plating and the practical service qualities of Kellogg condensers. Other views show the lamp, generator and cord finishing departments, punch presses, polishers, milling, screw machines and testing departments.

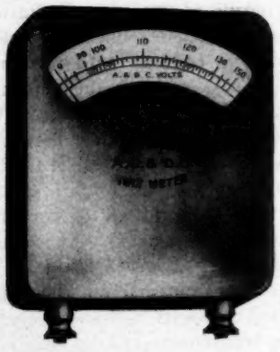
Fire Brings Rush Order for Dean Equipment.

The Dean Electric Company, Elyria, Ohio, has just received a rush order to replace the switchboard at Akron, destroyed by fire on Friday, October 7. A letter dated October 12, from Mr. Manson, of the Dean company, informs TELEPHONY that on that date everything was on the ground to complete the installation and "the board should be in operation before the end of the week." The board consists of four "Unit Type" sections, and the lay-out is made up directly in accordance with the customer's wishes, and not of a stock nature.

Pignolet Alternating and Direct Current Meter.

The accompanying illustration, which is one-half actual size, shows a new and inexpensive instrument, that will be of interest to telephone men who have occasion to measure alternating currents such as is furnished by magnetos.

This instrument is of an improved electromagnetic type, in



which an iron disk of peculiar shape is acted upon by a narrow rectangular coil of very small self-induction. The readings are, therefore, practically unaffected by variations in the wave form or frequency of ordinary alternating currents.

For the same reason, the readings are accurate also on direct current, but in common with all instruments of the electromagnetic type, stray fields must be avoided, such as are found near masses of iron, magnets and strong currents. However, the effects of these fields may be compensated by the usual method of taking the mean of two reversed readings where the highest accuracy is essential on direct current.

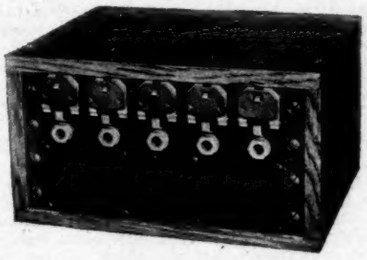
The instruments are furnished in various readings up to 25 amperes and 280 volts to suit different requirements. By a peculiarity of construction, it is possible to extend the divisions at the middle of the scale and to condense them elsewhere which enables a voltmeter to be furnished that will easily fit the pocket and at the same time has single volt divisions between 100 and 125 volts, permitting close reading of ordinary electric light currents.

MASSACHUSETTS CHEMICAL COMPANY announces that Mr. Charles A. Baldwin has been appointed manager of the New York office, succeeding Mr. Henry E. Cozzens, who resigned to enter other business.

New Railway Telephone Cabinet.

The Kellogg Switchboard & Supply Co., Chicago, Ill., is now furnishing a special cabinet for its No. 33 combined drop and jack for use on railway telephone dispatching and message circuits. Where more than one circuit is used, it will be found very convenient and a saver of equipment. The apparatus is mounted in strips of five in a good, substantial oak box, all connections being wired to terminals on the inside of the box. One telephone is switched, by means of a cord and plug, to any of the five jacks and lines.

When a call is received over a line on which telephone selectors are used, the circuit is so arranged that the selector throws the drop instead of ringing a vibrating bell, and the



New Dispatcher's Line Terminal Box.

drop in turn rings a vibrating bell. These drops are so arranged that by means of a switch, a bell may be caused to ring until answered, or a ring lasting only while the selector contacts are closed may be obtained.

When current is sent through the drop, its armature draws up and closes a pair of contacts; at the same time the shutter on the front of the drop is released and falls, closing another pair of contacts. The pair of contacts operated by the armature are closed only while the current is passing through the winding of the drop, and in this way give the short ring on the bell. The pair of contacts affected by the shutter are closed until the drop is restored.

It is very convenient to be able to have two lengths of rings where an office is busy in the daytime, and where an operator "goes in the hay" at night. For each case of ring the drop always furnishes a visual signal, which is restored by simply inserting the plug in the corresponding jack below, the shutter being restored by means of a simple mechanical arrangement.

As an illustration: It is suggested that drop and jack No. 1 be used on a telephone dispatcher's circuit; drop and jack No. 2 be used on a telephone message circuit; drop and jack No. 3 on block telephone east; drop and jack No. 4 on block telephone west, and drop and jack No. 5 on a yard telephone circuit—or even the line to the city telephone exchange.

It will be seen from this that the operator can operate all the lines with one telephone, from his chair. These drops may be arranged to operate on two cells of dry battery, or be bridged across any circuit in place of a bridging bell.

The Motor Wagon as a "Repair Wagon."

A telephone company in a rural community of Indiana for years maintained three teams and wagons, employing two men for each. Even with this equipment it sometimes found it difficult to keep its lines up to a high standard. Its attention was directed to a Schacht two-cylinder delivery wagon by a hardware merchant who owned one. It purchased a Schacht, with the result that within two weeks it had disposed of all horses and wagons and reduced its force of linemen to two men. Besides the saving in labor the up-keep of the machine was less than the maintenance of one team and wagon, and it enabled the company to increase the efficiency of its service and keep it at a high standard.

Another and larger telephone company situated in an eastern city use a Schacht machine for a "trouble wagon." Through this particular section the snow-fall is very heavy, and every telephone man knows what havoc a heavy fall of wet snow works. At such times this telephone company finds the Schacht machine especially valuable, as it enables linemen to make repairs in the shortest possible time.

Besides serving the purpose as a "trouble wagon" cheaper and better than horses and wagons possibly can, the Schacht can be converted instantly into either a runabout or four-passenger touring car. The removal of the sideboards makes it a runabout, while the addition of another seat converts the runabout into a touring car. This three-fold purpose the Schacht serves, together with its low initial cost and ability to do the work of six horses at the cost of one, made the Schacht leap into instant favor with telephone and other commercial companies.

The car is of the two-cylinder type, with a speed of three to fifty miles per hour, 22-24 horsepower, weight 1,600 pounds. It is manufactured by the Schacht Motor Car Company, 2734 Spring Grove Ave., Cincinnati. The company has issuel a handsome catalog showing this and other cars. These catalogs are being sent to interested parties.

NEW TRADE PUBLICATIONS.

A new bulletin, known as No. 193, has been issued by Roth Bros. & Company, Chicago, which is devoted to motors for a varied number of uses. It is a very complete publication of its type.

The Jewell Instrument Company, of Chicago, Ill., recently brought out a booklet containing thirty-nine pages of data relative to its electrical measuring instruments. It is profusely illustrated.

A price list of the latest pocket batteries has been issued by the Readrite Meter Works, of Bluffton, Ohio. This is a welcome visitor to many users of this style of battery.

The Automatic Time Stamp Company, Boston, Mass., has issued a card showing one of its automatic time registers, known as style D.

In a new publication, entitled Paragon Bulletin, No. 1, the Paragon Sellers Company of Chicago makes plain "Some New Facts About Grounding."

Telephone Fire Insurance Exchange, Cleveland, Ohio, is making a campaign this month for one hundred new members and an equal number of new policies.

Central Electric Company Chicago, Ill., in its October price list carries the usual complete and well arranged list of prices and discounts on standard telephone supplies, including fuses, guy anchors, cable rollers, bridle rings, post hole augers, lineman's tools, soldering tools, solder, rubber covered wire, tape, wire, etc.

Telephone Fire Insurance Exchange, of Cleveland, Ohio, is this week mailing a booklet, known as report No. 3, which gives much valuable information about telephone insurance emergency equipment, which it is proposing to carry for the protection of its members who carry Use and Occupancy Insurance. Companies will do well to read it with care, act on its advice and keep the report for future reference. Copies may be had for the asking.

Condensed News Reports

Officers of companies are earnestly requested to forward us promptly all financial and other statements as soon as issued and any items of interest as to their plants and systems

PERSONAL.

MR. H. C. COUCH has been made general manager of the Southern Telephone Company at Fordyce, Arkansas, succeeding Mr. Lee, resigned.

MR. FRED D. WRIGHT succeeds his father, Mr. A. J. Wright, deceased, as manager of the Bell telephone company's exchange at Tecumseh, Nebraska.

MR. EUGENE D. NIMS, president of the Pioneer Telephone and Telegraph Company, Oklahoma City, Oklahoma, has returned from a three months' pleasure trip through Europe.

MR. J. FRANK KIERNAN, for the past three years manager of the Holt County Telephone Company at O'Neill, Nebraska, has resigned that position. He will take up his residence in St. Joseph, Idaho.

MR. C. FRED BONNEY, formerly manager of the Southern States Telephone Company at Norfolk, Va., succeeds L. J. Oliver as district manager of the Southern Bell Telephone Company, with headquarters at Norfolk.

MR. WM. C. GETZ, of the United States Signal Service, who has completed the installation of the buzzer annunciator system on the target range at Fort Leavenworth, Kansas, is spending a month's vacation in Baltimore, Md.

MR. H. C. BARWICK has resigned his position as manager of the Southern Bell Telephone Comapny at Ellerton, Ga. Mr. Barwick resigns on account of failing health. He is succeeded temporarily by John W. Jarrell, Jr., district agency cashier at Athens.

MR. HARRY G. HAMILTON, formerly of Enid, Okla., is now superintending the telephone and telegraph construction of the Denver, Laramie & Northwestern Railroad, out of Denver. He reports that good progress is being made, the construction now going out of Greeley county toward Laramie.

COL. GEORGE W. FOSTER, assistant general manager of the Southwestern Telephone and Telegraph Company, Dallas, Texas, returned on September 19 from a trip throughout Europe. Mr. Foster spent a good deal of his time in Italy, but traveled through Switzerland, Germany, Belgium, France, and England.

MR. THOS. BROMLEY, JR., has been appointed manager of the Muskegon Telephone Company, Muskegon, Mich., and will, for the time being, have charge of this property, as well as of the United Home Telephone Company, of which he has for some time been general manager with headquarters at Ludington. It is proposed to raise the rates of the Muskegon company, and to improve the plant.

MR. EDWARD FITZGERALD, president of the Columbian Transfer Company, has been made active executive officer of the Citizens' Telephone Company, Grand Rapids, Mich., and will devote his entire attention to the work, having his office in the exchange building. Mr. Fitzgerald has long been vice president of the company. He is one of the city's most prominent business men, and is esteemed by all his business associates.

MR. JOHN C. POTTER has been engaged to take charge of the work in telephone engineering by Purdue University, La Fayette, Ind. Mr. Potter is a graduate of the University of Wisconsin, has earned its post-graduate degree of E. E., and for three years was instructor at that place, and did considerable work for the Wisconsin Railroad Commission. He was also assistant professor of electrical engineering at the University of Iowa. He comes to his duties in Purdue University from the employ of the American Telephone & Telegraph Company.

MR. M. F. KANE entered the employ of the Telephone Fire Insurance Exchange, Cleveland, Ohio, as inspector. Mr. Kane from 1900 to 1902 was in the general offices of the United States Telephone Co.; 1903-07, with the Norton Tool Co., manufacturers of telephone material; 1908-10, with the Standard Electric Co., of Cleveland, Ohio, the latter company doing general contract work in electrical wiring of business blocks, residences, etc. Mr. Kane's ten years' experience has given him an excellent opportunity to fit him especially for the work he is now undertaking. He is at present making a trip through Pennsylvania and Ohio.

MR. S. G. McMEEN, who upon completion of the initial construction of the plant of the Bay Cities Home Telephone Company, formerly the San Francisco Home Telephone Company, at San Francisco, Cal., assumed the position of vice president and general manager of this important property, is now one of the prominent boosters for an exposition at San Francisco in 1915. When McMeen boosts for anything he hides a determination to put it through behind a genial smile and a ready wit. But experience has shown that his methods are effective to a point which demonstrates his engineering skill in choosing a factor of safety. So let us all, in the telephone field, make up our minds to it and get ready to attend McMeen's exposition, San Francisco, 1915.

MR. WILLIAM B. MANN, general attorney for the Central Union Telephone Company, will hereafter beware of polite strangers when traveling on ocean steamships. As the story is told in Indianapolis, he allowed a young man to scrape an acquaintance with him on the boat, and obligingly consented to carry ashore some $50 worth of souvenirs which his new friend's trunk "was too small to hold." Mr. Mann dutifully declared his own effects, but was held up at the dock to account for those of the stranger.

"I told him he ought to be more careful next time and not omit anything from his declarations," naively said Mr. Mann. He also reported that the engaging stranger was from Chicago. Perhaps the next time Mr. Mann visits that city some one will kindly try to sell him the monument in Grant Park, or let him pay to see the Masonic Temple turn around.

"Information" Weds Prominent Broker.

A romance, not of the telephone but of the telephone girl, terminated in the marriage, on September 28, of Miss Ellen Marie Callahan, of Revere, information operator of the Oxford division of the Boston telephone exchange, to George K. Lord, of the brokerage firm of White & Bowditch, of Boston, son of George E. Lord, secretary of the Boston Stock Exchange.

OBITUARY.

C. F. HANSON, manager of the London and Manchester Telephone Company, at London, Ky., died October 9, at his home in London, of typhoid fever, after an illness of eight weeks. Mr. Hanson was a native of Berea, Ky., and was one of the best telephone men in eastern Kentucky, having been identified with telephone interests in that section for a number of years.

W. M. STEWART, division equipment superintendent of the New York Telephone Company, New York City, died from the effects of a stroke of apoplexy on October 5, at his home in Westfield, N. J. He was stricken on the morning of his demise, and was ill only a few hours. He had been identified with the company for a period of twenty years and was much beloved.

JOSEPH S. McKELL, of Chillicothe, Ohio, died about 10 days ago. His death will cause the loss of a staunch upholder of Independent telephony in Ohio. Mr. McKell was one of the best known business men of the Ross County capital and was interested in a queensware concern. He owned more than a controlling interest in both the Chillicothe Home Telephone Company and the Portsmouth Home Telephone Company, two of the most prosperous Independent concerns in that part of the state. For a number of years he had been a partial invalid, but was able to transact considerable business. He is given credit for making both the properties with which he was connected strong in their communities.

NEW COMPANIES.

PALISADES, COLO.—H. L. Davis, H. R. Haugh and H. H. Younger are the incorporators of the Mutual Light, Power and Telephone Company. The capital stock is $50,000.

GRAND TOWER, ILL.—The Preston Union Telephone Company has been incorporated by J. T. Evans, Adam Lyrley and T. L. Aldridge, with a capital stock of $4,350.

MACKSVILLE, KY.—The Mayes Telephone Company was recently organized by James H. George and S. M. Mayes.

PRYORSBURG, KY.—Dr. M. W. Rossell, W. T. Rossell and Noblin Rossell are the incorporators of the Pryorsburg Telephone Company. The capital stock is placed at $1,000.

COLEMAN P. O., MICH. (Isabella Co.)—The Black Ash Independent Telephone Company was organized for the purpose of carrying on a telephone and messenger service. Authorized capital $420, all paid in. Frank Ernest, Hugh Wilt and Wirt L Warner, all of Coleman P. O., Wise township, are the incorporators.

FRONT CREEK, MICH. (Ontonagon Co.)—The Front Creek and Calderwood Telephone Company has been incorporated to operate a telephone and messenger service with an authorized capital of $10,000. Louis Anderson, Calderwood, George and Rosa L. Hardes, Front Creek, are the incorporators.

TROUT CREEK, MICH.—The Trout Creek and Calderwood Telephone Company was incorporated with a capital stock of $10,000.

CUMBERLAND, MD.—A farmers' Mutual Telephone Company has been organized by residents of the Cumberland Valley. The following officers have been elected: E. T. Zembower, president; W. C. Bortz, secretary; H. W. Wertz, treasurer.

HAGERSTOWN, MD.—The Mt. Aetna Rural Telephone Company has been organized by C. H. Keller, William O. Funk and Henry C. Wolfe.

PORT CRANE, N. Y.—Among the newly incorporated companies is the Fenton Telephone Company, organized to construct a telephone line between Port Crane and Chenango Forks. It is capitalized at $500, paid in, and the following directors have been elected: E. W. Neff, Alvah Shepardson, Harvey Grippen, of Port Crane, N. Y., and E. E. Mowrey, D. D. Engle, Chenango Falls, N. Y.

HUNTSBURG, OHIO.—The Huntsburg Telephone Company has been chartered with a capital stock of $6,000, par value of shares $50. H. A. Pinney, G. H. Merwin, C. H. Adams and L. A. Tripp are the incorporators.

GUTHRIE, OKLA.—The Northwest Motor Company, Oklahoma City, has been chartered with a capital stock of $100,000. L. R. Weiss, Charles E. Stockler, C. P. Wichmiller, Earl Worl and H. M. Flickenger, all of Kingfisher, are the incorporators. The articles of incorporation grant permission to build railroads, telegraph and telephone lines.

SHAWANO, WIS.—The Shawano Telephone Company is the name of a newly incorporated telephone company. E. A. Krueger, J. J. Steiger, John B. Gordon and King Weeman are the incorporators. The capital authorization is $5,000.

MOSIDA, UTAH.—The Mosida Telephone Company has filed articles of incorporation with the Secretary of State, with a capital of $2,500. The officers of the company are: L. B. Curtis, president; W. F. R. Mills, vice president, and H. C. Allen, secretary and treasurer.

TORONTO, ONT., CAN.—The Interurban Telephone Company, Ltd., was incorporated with a capital of $200,000. The provincial directors are J. S. Lovell, W. Bain, R. Cowans, H. Chambers and S. M. Mehr.

FINANCIAL.

HUNTSVILLE, ILL.—The directors of the Shiloh Mutual Telephone Company at a recent meeting, reported that $1,000 of the old indebtedness has been paid off. The asse sment was reduced to $7 per share.

SUMMITVILLE, IND.—The Summitville Telephone Company has filed notice with the Secretary of State of an issuance of $3,000 preferred stock.

ELYRIA, OHIO.—The Elyria Telephone Company has increased the rate for business service in that city from $3 to $3.50 per month.

GALLIPOLIS, OHIO.—The property of the Gallipolis Telephone Company which has been in the hands of Receiver Cyrus Huling for several months, was sold at auction at Gallipolis, September 27, to E. L. Coen, of Vermillion, Ohio, a heavy stockholder in the concern. Mr. Coen paid $14,450, or slightly more than two-thirds of the appraised valuation. Mr. Coen announces that he will reorganize the company with new capital and again put it on its feet. The property consisted of a complete exchange with quite a number of subscribers. The appraised value of the property was $21,669.58.

LAIRDSVILLE, PA.—The Muncy Creek Telephone Company has filed an amendment to its charter, increasing the capital stock from $5,000 to $15,000. U. G. Boyer is secretary of the company.

WAUPACA, WIS.—The Citizens Telephone Company has petitioned the Railway Commission for permission to raise its single line business rates from $2.00 to $2.50 per month; party business telephones from $1.50 to $2.00 per month; and country line service from $1.25 to $1.50 per month. This raise in rental will be in lieu of all toll rates from city patrons to the telephones on various lines under the management of the local exchange which toll will be free if the raise is granted.

FRANCHISES.

SHARON SPRINGS, KANS.—C. E. Ward, Mayor, and P. P. Paxton, City Clerk, of this place, have issued notices signifying desire and willingness to grant a franchise to responsible parties who will establish and maintain a telephone system in Sharon Springs and surrounding rural districts.

CONSTRUCTION.

LOS ANGELES, CAL.—Work of installing telephones on the Los Angeles division of the Santa Fe railroad is under way. It is reported as probable that after the first of the year telephones will be installed on the San Diego line.

COLORADO SPRINGS, COL.—Workmen are installing a private telephone system in the public schools. Under the new arrangement each school building will have a telephone connecting with the central switchboard in the offices of the school board. There will be nineteen private telephones on the system, nad none of the school buildings will have outside telephones. The only main line or public telephones will be the two in the school board offices.

FORT WAYNE, IND.—The Home Telephone Company has responded to a petition from citizens and business men of Hicksville, O., by beginning the construction of a through line to that city. The new line will furnish greatly improved telephonic communication for not only Hicksville but points throughout northwestern Ohio. The new cable for the Spy Run line in the extreme northern Spy Run district has been received and will be put up at once.

MACEY, IND.—The plant and holdings of the Macey Telephone Company have been purchased by Claude Warner and A. O. Yeareck, or Argus. The new owners are planning to remodel and extend the system.

WAVELAND, IND.—The Waveland Telepnone Comopany will replace its wire in cross streets with cable.

M'LOUTH, KAN.—The McLouth Telephone Company, of which Mr. A. H. Manning is manager, is moving into a new fireproof exchange building. The wires in the business section and important residence streets are rapidly being put into underground conduit.

WALTON, KENTUCKY.—The Consolidated Telephone Company of Walton, Kentucky, of which W. G. Black is general manager, is rebuilding the telephone lines and establishing a trunk line, metallic circuit, between Walton and Warsaw. This will, when completed, connect this territory by long-distance service with Louisville and Cincinnati. Mr. Black announces that he will rebuild all the lines of the Gallatin County Telephone Company, which he recently purchased from Harold Brown, and make the system of the best.

DETROIT, MICH.—The Detroit River Telephone Company has prepared plans and specifications for exchanges to be erected in Wyandotte and Trenton. These plans have been placed in the hands of Henry Roehrig, of Wyandotte, who is vice president of the company. They call for one story structures, fireproof, and of concrete and steel construction.

DETROIT, MICH.—The Pere Marquette railroad has ordered material to equip a line from Saginaw, Mich., to Toledo, O., approximately 135 miles in length, with the telephone for train dispatching. This is understood to be the beginning of the adoption of the telephone system over the entire road, extensions to follow the completion of the first circuits. Between Saginaw and Toledo there will be 30 telephone stations. The chief dispatcher will be located at Saginaw.

CHESTER, MONT.—L. D. Pugsley, a ranchman, is planning to have lines strung between Chester and his ranch on the Marais. The line will be connected with toll lines to Fort Benton and Great Falls.

WADESBORO, N. C.—The Wadesboro Telephone Company is rebuilding its entire plant. New poles and new lines with a modern switchboard mean a considerable expenditure. The local company is determined that its service shall keep pace with Wadesboro's growth in other lines and show their confidence in the future of the town by the continual investment of their earnings for the improvement of their plant.

FARGO, N. D.—The management of the Tweeden hotel is having installed a private telephone switchboard with connections in all the rooms. The system will comprise 76 telephones and will be operated by the clerks at the desk.

VANPORT, OHIO.—A telephone line for dispatching trains is being established by the Steubenville and East Liverpool Traction and Light Company between Vanport and Steubenville, Ohio. Operation will begin early in October. Stations will be established at Vanport, Industry, Midland, East Liverpool, Wellsville, Toronto and Steubenville.

LEBANON, OHIO.—Improvements are being made by the Valley Telephone Company. The company has just purchased the building it now occupies, and contemplates the erection of a new structure. Placing the wires underground is also being favorably considered by the company.

MT. GILEAD, OHIO.—The Morrow County Telephone Company is erecting a fifty pair cable beetween this place and Edison. Subscribers of local exchanges at Denmark and Edison are to be connected directly with the switchboard at Mt. Gilead, doing away with the present toll service between these places.

YOUNGSTOWN, OHIO.—While grading near the Pennsylvania station recently a gang of Italian laborers came upon a cable of the Youngstown Telephone Company, and, not knowing what it was, cut it off and threw the pieces to the surface. Part of the connection between the north and south sides of the city was destroyed.

READING, PA.—The Conestoga Telephone Company is installing telephone service in the village of Rattlesnake Hill. The inhabitants have not had service and this will be of great service.

PETERBORO, ONT.—The Canadian Machine Telephone Company is asking an extension of its franchise in Peterboro for twenty-one years. The company promised to spend $10,000 in extensions and to give free connections with all rural telephones within a radius of 10 miles.

ELECTIONS.

BLOOMINGTON, ILL.—The annual meeting of the Dawson Township Mutual Telephone Company was held recently. The reports showed the company to be in a good financial condition. The retiring trustees, M. Richardson and J. W. Cole, were reelected. The board of trustees elected M. Richardson, Jr., president and manager; Lewis Coale, vice president, and W. D. Wightman, secretary and treasurer.

EUREKA, ILL.—The Eureka Farmers' Telephone Company held its first annual meeting recently. Reports from the manager and the treasurer show that the company is in a very prosperous condition and that the system has been greatly expanded during the six months that the new company has been in business and the system is in better physical condition than ever before. Fifty-one new telephones were installed in Eureka during the period from March 10th when the company took hold, besides the additions made in the country. The company has put in 4,000 feet of cables in the city besides a large number of new poles. Fifteen hundred dollars has been paid on its indebtedness, leaving a debt of $3,000 on the purchase price. J. W. Tomb was re-elected director for three years; and Charles J. Gibson was re-elected treasurer.

BRIGHTON, IOWA.—The annual meeting of the stockholders of the Brighton Mutual Telephone Company was held recently. The following officers were elected: President, J. W. Meyers; vice president, Dr. R. A. McGuire; secretary, Anson H. Brinton; treasurer, C. H. Lloyd. A committee of three consisting of Fred Williams, C. C. Heacock and J. F. Craff was appointed to take immediate charge of plant, its property and records and make an invoice of same.

JOPLIN, MO.—The following directors were elected by the stockholders of the Joplin Home Telephone Company: Breckenridge Jones of St. Louis, Theodore Gary of Macon, W. H. Warren of Joplin, A. F. Adams of Joplin and R. E. Frye of Carthage.

NIAGARA FALLS, N. Y.—At the annual meeting of the directors of the Niagara County Home Telephone Company the following officers were elected: President, A. H. G. Hardwicke of Niagara Falls; first vice president, W. T. Ransom of Lockport; second vice president, Benjamin L. Rand of North Tonawanda; secretary and treasurer, Miss Stacia Baker of Niagara Falls; general manager, R. Max Eaton of Niagara Falls.

MISCELLANEOUS.

FORT SMITH, ARK.—The Pioneer Telephone and Telegraph Company suffered a loss of several hundred dollars through damage by fire. About 300 telephones were put out of order and 1,000 feet of cable fell.

LOS ANGELES, CAL.—The fire commission has decided to paint all poles bearing fire alarm boxes with distinctive colors to make them easily visible at a distance. Each pole will have a strip of brilliant red, beginning at a point 18 feet above the ground and extending upward about three and a half feet and above that another band of white a foot higher. The Home and Pacific telephone companies have given their permission to the commissioners to paint their poles.

PRINCETON, IND.—The oil fields of southern Indiana and Illinois are being connected by telephone. A line extending from Marshall, Ill., to Oakland City, Ind., is being built by the Ohio Oil Company. Offices of the company will be established in each of the places where the company has holdings. With this line the district offices at Marshall hope to keep in direct touch with the daily operations throughout this section.
tion.

CLINTON, IOWA.—The Tri-State Telephone Company has equipped the Fowle & Spreter establishment with a teleephone system connecting all departments with each other and the central exchange.

KNOB LICK, KY.—The Mutual Telephone Company has sold its entire plant to the Glascow Home Telephone & Telegraph Company.

CALUMET, MICH.—The Copper Range railroad will displace the telegraph instrument with telephones for the dispatching of trains, it is reported. The first instrument of the new system has already been installed in the Calumet station of the road. The instruments are to be connected with the offices of the chief train dispatcher at Houghton.

MINNEAPOLIS, MINN.—The Tri-State Telephone & Telegraph Company in a recent report gives the number of telephones operated by the company as 51,530, of which 19,921 are in Minneapolis, 10,638 in St. Paul, and 20,977 elsewhere. The figures are to May 1. The number has increased greatly since. The annual report of the company for 1909 shows earnings of $1,210,399 gross compared with $657,455 in 1905, an increase in five years of $552,944 or 84 per cent.

GEORGETOWN, MISS.—The exchange building of the M. H. Moore Telephone Exchange is reported to have been destroyed by fire. A loss of $20,000 is estimated.

JACKSON, MISS.—Mr. N. E. Robb, manager of the Mississippi Home Telephone Company was in Hattiesburg recently on business connected with the telephone system. The long distance business of this company is growing very rapidly as well as the local business, and those interested express themselves well pleased with the progress.

ST. JOSEPH, MO.—The Home Telephone Company has leased additional warehouse property.

ORD, NEB.—The Independent Telephone Company has purchased a motorcycle for the use of its troubleman.

M'CLUSKY, N. D.—The Sheridan County Telephone Company has recently installed a switchboard at McClusky.

BALLSTON, N. Y. (Saratoga Co.).—Erwin Clark, a lineman who was injured by falling with a pole which broke under his weight and who had sued the New York Telephone Company for $25,000, was awarded $150 by a jury.

CATSKILL, N. Y.—The Albany Home Telephone Company has purchased the system of the West Shore Home Telephone Company, which operates mainly rural lines.

TROY, N. Y.—It is reported that the New York Central Railroad will install a telephone system for dispatching trains on the Adirondack division of the road.

BARNESVILLE, OHIO.—The Baltimore & Ohio railroad company is considering the adoption of telephones for dispatching trains.

COLUMBUS, OHIO.—General denial of the city's allegations that there is due Columbus thousands of dollars as the city's share of the receipts under the company's franchise, is made by the Columbus Citizen's Telephone Company. The company filed its answer to the city's suit recently. No part of the companys receipts have been paid to Columbus since 1904. The suit has been hanging in local courts for several years, legal questions having been decided first. The company admits the contract and also that it agreed to pay the city for any damage done in the streets, and maintain that this contract has been kept.

EATON, OHIO.—The First Christian Church of this city has inaugurated telephone service for transmitting the sermons to members of the church confined at their homes.

ALLEN, OKLA.—The Francis Telephone Company reports that the company is doing splendidly lately. During the month of September, 31 telephones were installed.

FAIRFAX, OKLA.—Sperry Brothers, owners of the local telephone exchange, are now occupying a handsome new building, recently completed. They have also rebuilt their lines, using cable, new poles, etc.

DUBLIN, PA. (Bucks Co.)—A rural telephone line with about 25 subscribers has been constructed and recently placed in opera-

SLIPPERY ROCK, PA.—The Slippery Rock Telephone Company will build a new circuit between Slippery Rock and Kiester's in the near future.

VOLANT, PA.—The Plain Grove Telephone Company is carrying on considerable reconstruction and repair work at present.

BONDUEL, WIS.—The Bonduel Telephone Company will soon build an extension by the way of Lansted to Elmdale. About 28 new subscribers will be added by the building of this extension.

SPRINGFIELD, TENN.—The Springfield Home Telephone plant was sold under a decree of the Chancery court to A. H. Cady of Ohio, representing the bondholders, for $9,250.

MEXIA, TEXAS.—Mr. Finck of Wills Point has purchased the holdings of the Mexia Telephone Exchange.

PRAIRIE DU CHIEN, WIS.—The owners of the Prairie du Chien Telephone Company have disposed of a third interest in the company to J. A. Murray, for some time manager of the Baraboo (Wis.) Telephone Company. The system is owned by John Calaway of La Crosse and O. W. Sherman of Reedsburg. Mr. Murray will become manager of the system. When Mr. Murray took the management of the Baraboo telephone system about seven years ago the company had 330 subscribers, and when he gave up the work, service was being given to 1,026 subscribers.

WATERTOWN, WIS.—The exchange of the Wisconsin Telephone Company was destroyed by fire a short time ago.

VANCOUVER, B. C.—Through the misunderstanding of orders by waterworks employees the telephone cable connecting the Vancouver and North Vancouver systems of the British Columbia Telephone Company was severed at First Narrows and all telephonic communication with the district on the north side of the inlet was cut off. On account of tidal conditions it was impossible to work at reconnection for some time.

WINNIPEG, MAN., CAN.—The Manitoba government telephone commission has let the contract for the new exchange to be erected at St. John to J. M. and J. J. Kelly. Exclusive of ventilation and plumbing the estimated cost is $38,000. The new exchange will have a capacity of 10,000 lines and will take care of all patrons north of the C. P. R. Work will be commenced at once and the building will be finished early in the coming year.

PORT HOOD, N. S.—The Valley Telephone Company recently established an exchange in this town and constructed a submarine cable about 6,000 feet long, connecting Port Hood Island.

UNDERGROUND.

PRINCEVILLE, ILL.—The Keck Telephone Company, W. M. Keck, manager, is replacing its open wire with cable and installing consiuerable underground conduit.

NORFOLK, NEB.—The Nebaska Telephone Company, according to reports, will place its wires in the business section in underground conduit. An order to remove poles and wires from the business section of the town was recently issued by the City Council, and the company was granted a year in which to do the work.

INDEPENDENCE, MO.—The Missouri and Kansas Telephone Company has been granted permission to lay its wires in underground conduit in the business streets of the city.